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VRIJE UNIVERSITEIT

New directions in Terror Management Theory

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad Doctor aan
de Vrije Universiteit Amsterdam,
op gezag van de rector magnificus
prof.dr. L.M. Bouter,
in het openbaar te verdedigen
ten overstaan van de promotiecommissie
van de faculteit der Psychologie en Pedagogiek
op woensdag 5 september 2007 om 13.45 uur
in het auditorium van de universiteit,
De Boelelaan 1105

door

Arnaud Wisman

geboren te Vianen

promotor: prof.dr. P.A.M. van Lange

copromotor: dr. S.L. Koole

The trouble with words is that you never know whose mouths they have been in.

Dennis Potter

The surest way to corrupt a youth is to instruct him to hold in higher esteem those who think alike than those who think differently.

In individuals, insanity is rare; but in groups, parties, nations and epochs, it is the rule.

Out of damp and gloomy days, out of solitude, out of loveless words directed at us, conclusions grow up in us like fungus: one morning they are there, we know not how, and they gaze upon us, morose and gray. Woe to the thinker who is not the gardener but only the soil of the plants that grow in him.

The desire to create continually is vulgar and betrays jealousy, envy, ambition. If one is something one really does not need to make anything --and one nonetheless does very much.

There exists above the "productive" man a yet higher species.

The individual has always had to struggle to keep from being overwhelmed by the tribe. If you try it, you will be lonely often, and sometimes frightened. But no price is too high to pay for the privilege of owning yourself.

There is more wisdom in your body than in your deepest philosophy.

Friedrich Nietzsche

I think, therefore I am, is the statement of an intellectual who underrates toothaches.

Without the meditative background that is criticism, works become isolated gestures,
historical accidents, soon forgotten.

Milan Kundera

I hope I never get so old I get religious.

Ingmar Bergman

Life is full of misery, loneliness, and suffering - and
it's all over much too soon.

Woody Allen

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From the very first moment that I read about Terror Management Theory, it has been my dream to do research in the field of social psychology. I am extremely delighted that the University of Kent at Canterbury gave me the opportunity to pursue a career as a social psychologist. I feel at home at Canterbury, and I am aware that I am lucky to be surrounded by so much talented and helpful colleagues from all over the world. Specifically, I thank Dominic Abrams, for his unconditional support, encouragement and mentorship. Also I thank my English colleagues for putting aside all their moral values and tolerate the lack of carpet in my office.

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In memory of Ego, my dear friend

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CHAPTER 1

Introduction

‘Death is more universal than life; everyone dies but not everyone lives’. (A. Sachs)

‘It's not that I'm afraid to die, I just don't want to be there when it happens’. (Woody Allen)

Over the years, writers, philosophers, poets, priests and politicians have voiced numerous opinions about life and death. Why are we on earth? Or why on earth are we here? What is the meaning of life? How can we find meaning given the realities of life and death? These kind of ‘existential’ questions have occupied the mind of sundry great minds. From Socrates to Oscar Wilde, Friedrich Nietzsche to Winston Churchill, Buddha to Simone de Beauvoir, virtually all well known historical characters have explored existential issues in one way or the other. But to what extent are existential issues, and more specifically, people’s knowledge of mortality, relevant to understanding human behavior? How do people come to terms with the recognition of their own mortality? These questions constitute the central themes of this dissertation.

Although we can banter and joke that death is the only problem that solves all problems, it is hard to deny that death has a severe impact on our lives. The unavoidable basic consequence of dying is that we will be separated from all the people we love (and on the positive side also those who we hate), lose our senses and our sensibility, and supply a meal to a variety of insects. But death also makes us, us. Imagine for instance that we would be

immortal (see also Dechesne, 2001). It would be literally possible to love someone forever, or play chess till the game unveiled all its secrets. Probably, only utterly boring people would engage in bunging jumping because one might as well jump out of a plane without a parachute (the examples do not necessarily reflect any specific predilections of the author). On the other hand, if we would only live for one day, our lives might resemble the lives of an ephemeroptera*. There would be no time for school, dinners, poems or love songs. We would instead, be born, procreate, and find ourselves dying even before sunset. In other words, a universe where humans are either immortal, or extremely mortal, would be the end of the world as we know it. But death is more than a marker of time.

The understanding and knowledge of the inevitability of our own death is something that is assumed to be uniquely human (e.g., Greenberg, Pyszczynski, & Solomon, 1990). Other living organisms, chickens for instance, seem rather indifferent if another from the brood, dies. The majority of animals such as snakes, appear even cold blooded towards their dead ‘friends’, that is, they eat them. Even primates, genetically much closer to us, do not seem to comprehend death the way we do. For example, when chimpanzees’ mothers encounter their dead young offspring they often continue their attempts at breastfeeding sometimes days after the passing of their offspring. Only when the young body starts to decay, the mother refrains from attempt to feed her young (de Waal, 2002). Elephants are the only non- human species known to have some sort of burial rituals (McComb et al., 2005). Moreover, elephants show a specific interest in the skeleton remains of their species (McComb et al., 2005). Recent research (McComb et al., 2005) revealed that elephants discriminate between bones of their own kind, versus other animals. It is not clear however, if

* Also known as ‘mayflies’.

elephants really mourn about a specific beloved member of their herd or what the purpose is of burying the remaining bones of their fellow species.

As it seems we are the only ‘animals’ that have an awareness of their own mortality. In fact, even humans are happily unaware of their own mortality till they reach the age of approximately seven years (Florian & Kravetz, 1985). However, as soon as our cognitive abilities allow it, we start to ponder about death. Thus, although we share with other animals an instinct for self preservation, only humans evolved as symbolic, spiritual beings. Our cognitive capacities created several adaptive advantages, such as anticipation of future events, making plans, developing and organizing our schemas and delaying our behavior so as to reconsider alternative responses. However, our cognitive complexity bestows upon us the horrifying recognition of one’s inevitable transience (Becker, 1973). Mortality is an unbearable foresight, for a physical animal instinctively programmed for survival. When we confront our own mortality we run the risk of drowning in a terrible state of death anxiety (Becker, 1973) that sometimes depressed people suffer from (Simon, Greenberg, Harmon-Jones, Solomon, 1996).

To thwart paralyzing terror, humans engage in all kinds of psychological activities according to the philosopher, Ernest Becker (1973), that are directed towards overcoming the petrifying awareness of mortality. This dissertation will further delve into the question how people come to terms with their own mortality, and how this regulation affects our behavior, thoughts, emotions, and motivations.

Terror Management Theory

Approximately twenty years ago, three ingenious social psychologists from the USA, Jeff Greenberg, Tom Pyszczynski, and Sheldon Solomon (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989; Solomon, Greenberg & Pyszczynski, 1991 Greenberg et al., 1997; Pyszczynski, Greenberg, & Solomon, 1999) were inspired by the work of Becker and used their experience in social and experimental psychology to formulate a testable and falsifiable theory, Terror Management Theory (TMT; Solomon, Greenberg & Pyszczynski, 1991). In line with the aforementioned ideas of Ernest Becker (1973), TMT postulates that human beings are prone to a state of 'terror' or death anxiety because humans are on the one hand programmed with an instinct for survival and on the other hand humans are aware of the fact that survival is a mission impossible. That is, sooner or later humans like other organisms are prone to death. Ernest Becker (1973) argued that this paradox of the human condition, is at the core of human motivation.

Accordingly, TMT posits that an important source of human motivation can be traced back to managing 'terror'. The TMT posits that people manage this 'terror' with the same cognitive capacities that render them aware of the problem of mortality in the first place. More specifically, people's advanced cognitive abilities allow them to construct a 'reality' that extends beyond the simple realities of life and death. This constructed 'realities', or worldviews provide: order, permanence, meaning, and a promise of literal and symbolic immortality. Cultural worldviews can make individuals to believe that some important aspect of themselves (e.g., soul, work, values) will live on after the death of their biological body; either literally or symbolically. By living in accordance with a cultural worldview, individuals can attain high self-esteem which in turn buffers them for the fear of death.

Both, cultural worldviews and self-esteem, function as a kind of psychological 'immune system'. Reminders of mortality activate this 'psychological immune system' and the 'healthy' management of terror. Thus, in a sense, TMT elucidates why most people do not suffer continuously from existential concerns. Moreover, TMT explains why people with very poor self esteem (for instance people who suffer depression) do seem to have frequent thoughts of death and suicide (Simon et al., 1996)

Research in terror management has been focused predominantly on two hypotheses. The first is the anxiety buffer hypothesis which states that if the self esteem functions as a kind of immune system, then raising one's self esteem (or dispositional high self esteem) should reduce death related anxiety. Thus, strengthening the psychological immune system should reduce anxiety-related behavior, and weakening this structure should induce anxiety-related behavior.

Several experiments have supported these hypotheses. Self-reported anxiety, physical arousal and anxiety-related defensiveness after the presentation of threatening stimuli were reduced by temporal as well as chronic high self-esteem (Greenberg, Pyszczynski, Solomon, Pinel, Simon & Jordan, 1993; Greenberg, Pyszczynski, Solomon, Rosenblatt, Lyon & Pinel, 1992). More recently, experimental induced and chronic high self-esteem were shown to reduce defensive responses to death-related concerns (Harmon-Jones, Simon, Pyszczynski, Greenberg, Solomon, McGregor, 1997).

The majority of the TMT research has been designed to test the second hypotheses, the mortality salience hypotheses. The rationale behind this hypothesis is that, if the psychological structure of worldview and self-esteem functions as a buffer against death-related concerns, evoking these concerns should increase the need for that structure. The

mortality salience hypothesis states therefore, that reminding people of their own mortality (mortality salience) increases the need for the protection provided by faith in the cultural worldview. As a result, people who impinge on one's worldview threaten the anxiety buffer, and should be evaluated more negatively; and people who support the own worldview should be evaluated more positively. Therefore, mortality salience should amplify preferences for 'worldview-supporting others' over 'worldview-threatening others'. These 'preferences' are defined as worldview defenses.

In support of these hypotheses, over 250 experiments to date have shown that reminding participants of their own mortality (usually induced by an open ended question such that participants could express their thoughts and feelings about death) led them to evaluate people who uphold their own worldview more positively and those who challenge it more negatively. The evidence strongly suggests that mortality salience leads to an increased preference for those who eulogize or share one's beliefs (Greenberg, Pyszczynski, Solomon, Pinel, Simon, & Jordan, 1993; Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992), increased rejection and avoidance of out-group members (e.g., Greenberg et al., 1990; Ochsman & Mathy, 1994), harsher judgements against those who violate one's moral principles (e.g., Florian & Mickulincer, 1997; Ochsman & Reichelt, 1994; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989) and an increased in-group bias in the minimal group setting (Harmon-Jones, Greenberg, Solomon, & Simon, 1996) Moreover, a recent set of studies has extended these findings to actual behavior, by showing that mortality salience can promote aggression towards others who have threatened one's worldviews (McGregor et al., 1998). For a broad review see Greenberg et al. (1997).

Mortality salience has been typically manipulated by having participants respond to two open-ended questions regarding their attitudes toward death (e.g., “Please briefly describe the emotions that the thought of your own death arouses in you” and “Jot down, as specifically as you can, what you think will happen as you physically die and once you are physically dead”). Moreover research also revealed that mortality salience effects are caused by thoughts of death and do not stem from any generally anxiety provoking contemplation. First of all, across a variety of outcomes, reminders of death have been found to produce different effects than numerous control conditions (Arndt et al., 2005).

Furthermore, the described mortality salience effects are found in response, not to conscious contemplations of mortality, but to recently activated concerns about mortality that are no longer consciously accessible. It is when mortality concerns are unconscious that they activate symbolic defenses pertinent to the individual’s basis of meaning and value (e.g., Arndt, Greenberg, Pyszczynski, & Solomon, 1997). According to the terror management theory (Pyszczynski, 1999) people use a twofold defense strategy (see figure 1) to cope with the aversive awareness of one’s mortality. When people consciously think about death they make use of ‘rational’ efforts to diminish the problem of death. For instance, people thrust the problem of death to the future by denying the possibility that they will die young or they ‘reason’ that death is hardly a dilemma, since they will surely go to heaven. All these seemingly rational efforts serve to deny the daunting thought about the end of existence and the aversive feelings that are potentially aroused by such thoughts.

Thus, at least at a conscious level people manage to remain unaffected by thoughts about death. But are such rational *proximal defenses* sufficient to deal with the problem of mortality? Presumably not. A large body of research shows that people use *distal defenses*

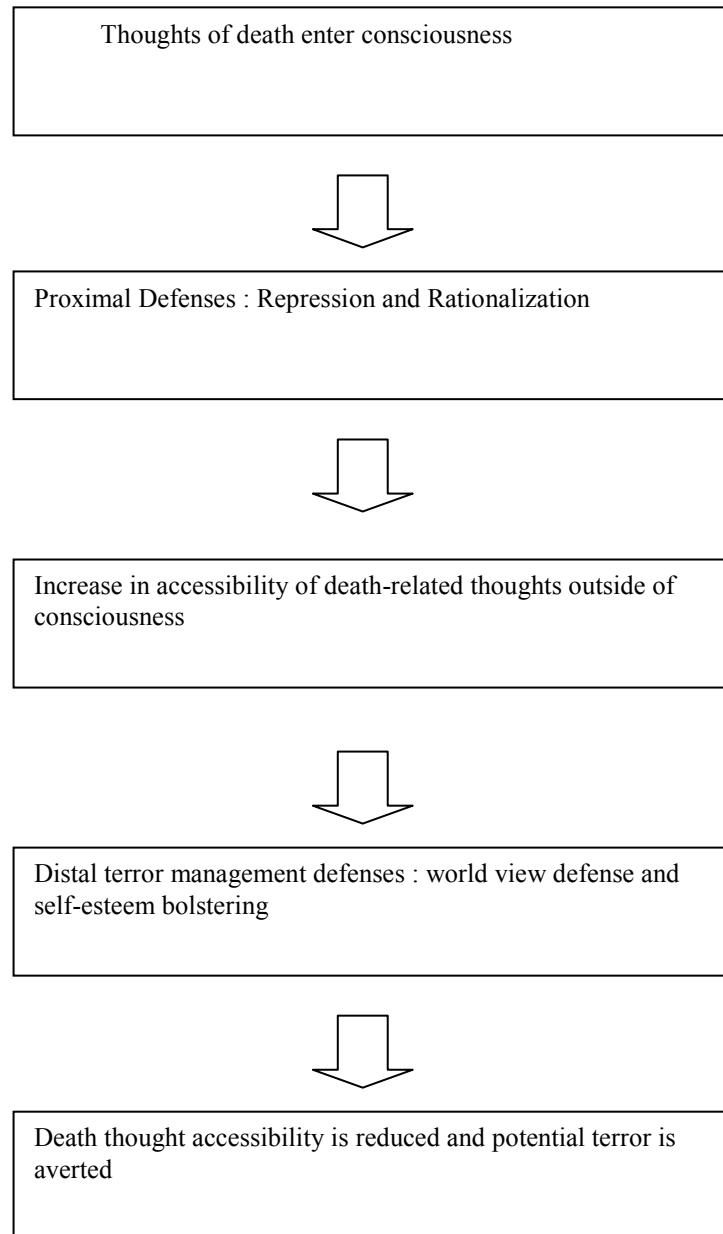


Figure 1: Defensive processes activated by conscious and unconscious death-related thought.

that are seemingly unrelated to the problem of death to manage the otherwise disturbing awareness of mortality (for a broad review see Greenberg et al., 1997). Thus mortality salience effects typically occurs when death thoughts are highly accessible but out of focal awareness. Indeed, in most TMT research, symbolic defenses are assessed when an explicit contemplation of one's mortality is followed by an intervening delay (e.g., Greenberg et al., 1994), or alternatively, unconscious mortality concerns can be activated via subliminal death primes (e.g., Arndt et al, 1997).

New Directions in the Terror Management Theory

Over the years TMT has provoked countless debates, as been witnessed in several special issues in social psychology (e.g., *Psychological Inquiry*). The debates surrounding the TMT, inside and outside academia, are often characterized by a remarkably sharp tone, and in my point of view, regularly blurred by the different levels of analysis of research questions scholars have in mind. Therefore, I believe that it is useful to distinguish between different approaches of studying the merits of TMT. Moreover, I will clarify which approach I will take in the remainder of this dissertation. I will distinguish between three different lines of research that are more or less inspired by the TMT.

The first line of research disregards the TMT as a valuable universal account of human motivation and focuses on developing alternative theoretical accounts of human behavior (Baumeister & Leary, 1995; Burris & Rempel, 2004; Martin, 1999). These theorists often argue that humans are only partly, if at all, motivated by the awareness of mortality, and they propose alternative theoretical accounts to explain human motivation. For instance, Baumeister and Leary's *Need to Belong Theory* (NBT; Baumeister & Leary) states that the

need for interpersonal attachments is a fundamental motive that has evolved for adaptive purposes. This theory is supported by the finding that people feel anxious when they face exclusion from their social groups (*social exclusion theory*) and argues that peoples fundamental need to belong overrides other motives such as people's motivation to regulate existential angst (see for broader review remainder of this dissertation).

Another line of research is more concerned with the question whether TM effects (e.g. worldview defense) are uniquely related to mortality salience reduction (Van den Bos et al, 2005; Martin, 2005; McGregor, Zanna, Holmes, & Spencer, 2001). For instance, based on their uncertainty management model (Van den Bos & Lindt, 2002), van den Bos et al., (2005) showed in a provoking set of studies, that part of the typical mortality salience effects can be explained by people's motivation to reduce uncertainty. More specifically, reminders of uncertainty had a bigger impact on several measurements of norms and values than reminders of mortality and, moreover, mortality salience effects were stronger if participants thought about the uncertainty that is related with thoughts about one's own demise (see van den Bos et al., 2005).

A third line of research does not question if existential concerns play a significant role in human motivation but rather focuses on the question of how people come to terms with existential concerns and by which management strategies. This dissertation will mainly focus on the third line of research.

To fully examine the question how, and by which means, individuals manage existential concerns I will employ a twofold strategy. First, I will consider several alternative terror management strategies aside the ones that are proposed by TMT. More specifically, I will argue that individuals can regulate existential concerns with other structures than solely

cultural worldviews. In Chapter 2, I will consider the possibility that belongingness can function to manage existential fears. Then in Chapter 3, I examine the role of a desire for offspring in coping reminders of mortality.

Second, I will offer a more general framework in Chapter 4, that bridges Chapter 2 and 3, and delves into the more generic questions, as to which strategy individuals may employ to manage terror, and moreover, how this strategy may work to achieve the management of existential concerns. Before I will present these Chapters into full length, I will briefly give a short overview of each Chapter.

To Belong or to Believe?

The TMT posits that culture and more specifically cultural worldviews serve a defensive function to cope existential concerns. But are worldviews the only ‘weapons’ against existential concerns? I believe that there are several arguments for the thesis that humans use a broader and more extended system to regulate existential concerns, than the TMT suggests.

First of all, several critics (for a broad overview see Psychological Inquiry, 1997) have argued that people make use of worldviews in a more flexible way than is advocated by the TMT conceptualization of worldviews. According to Pyszczynski et al. (1997) people commit themselves to a specific worldview and search for consistent information, and avoid inconsistencies. However, several findings contradict this thesis. For instance in a study conducted by Brock (1962) ‘non Catholics’ were asked to write an essay on the subject "why I would like to become a Catholic". Following TMT one would expect that participants would defend their worldview by rejecting the Catholic view. On the contrary however it was found

that participants indicated a stronger preference for the Catholic view. Since participants did not defend their worldview, the TMT definition of worldviews will hold only if we assume that participants internalized an entirely new worldview during the experiment.

Moreover, several other TMT experiments (Arndt, Greenberg, Solomon, Pyszczynski, Schimel, 1999) seem to contradict the worldview-conceptualization (Harmon-Jones, Greenberg, Solomon, & Simon, 1996). For instance, the minimal-group setting was designed to show that a random placement of participants in two groups can induce intergroup discrimination (Tajfel, Billig, Bundy, & Flament, 1971). The minimal group paradigm was employed to test the hypotheses that mortality salience induces intergroup bias. Harmon-Jones et al. (1996) divided groups on the base of preference of the painter Kandinsky or the painter Klee. The mortality salience induction did strengthen the preference for the "own" group indeed. Since both groups were American students sharing a common worldview we may rhetorical question 'Is art a more essential part of American students worldviews than their nationality?' We must fear that this is not the case.

Altogether, several findings in the field of Social Psychology indicate that people sometimes "forget" their own beliefs and values in order to fulfill the expectations of immediate social pressure (see also, Marques, Abrams, Paez & Hogg, 2001). In other words the previous examples suggest that the TMT overvalues the stability and consistency of worldviews and undervalues the role of a social dynamics.

Second, in line with TMT it can be argued that humans had to deal with the problem of death before they developed more symbolic solutions to address the problem of death. If this argument is correct, then in earlier stages of our cultural development, humans relied on pre-symbolic structures to manage death awareness. Pre-symbolic mechanism include

phenomena such as affiliation, procreation, secure attachment, and physical action. These mechanisms are evolutionarily and developmentally more basic than symbolic mechanism and do not require as great an involvement of symbolic capacities.

Our ancestors, according to evolutionary psychologists, lived for the first 90 percent of their existence in small, close knit groups (Lee & Devoir, 1968; Sahlins, 1972). From an evolutionary perspective, belonging to a group confers many important advantages on the individual, such as improved ability to gather food, increased likelihood of mating, and greater protection against threats in the environment (Baumeister & Leary, 1995; Buss, 1991; Sedikides & Skowronski, 1997). Given the important adaptive benefits associated with belongingness, Baumeister and Leary (1995) proposed in their Need to Belong Theory (Baumeister & Leary, 1995) it seems plausible that some powerful psychological mechanisms would have evolved to ensure that individuals maximize the association between themselves and their social group, and minimize the danger of becoming isolated or expelled from the group (Abrams, Marques & Hogg, 2005; Baumeister & Leary, 1995; Mikulincer et al., 2000; Taylor et al., 2000).

Moreover, there is evidence that affiliation strivings and in relation, fear of exclusion, are connected with stress regulating. In a fascinating article by MacDonald and Leary it is for instance argued and illustrated that social and physical pain overlap as an evolved mechanism that functions to respond to threats of social exclusion. When participants in a study, were excluded via implicit and explicit exclusion primes, they showed a heightened pattern of ACC (Anterior Cingulate Cortex) activation. The ACC has been well established as a part of the brain that is associated with processing physical pain signals. Thus, this findings (MacDonald & Leary, 2005) suggests that it literally hurts to be excluded.

Given the previous theoretical and empirical overview that illustrates the importance of belongingness, I will argue in Chapter 2 that affiliation strivings can function to regulate existential concerns. Moreover, I will hypothesize that affiliation strivings can override the need to validate one's worldview after reminders of one's mortality. Finally, I contend that both TMT and the NBT are not mutually exclusive to the extent that people may use affiliation strivings as a means to ward off existential concerns.

The Immortal Desire for Offspring

Nature hopelessly failed to make us immortal. As we have seen, TMT postulates that human beings use the same cognitive capabilities that render them aware of the problem of mortality in the first place to develop means of managing the problem. As aforementioned, the management of terror is posited to occur via a symbolic system of defense in which culturally constructed views of the world provide protection by offering a sense of meaning and, importantly, a promise of symbolic immortality to individuals who uphold cultural standards (Greenberg et al., 1997). People who subscribe to religious worldviews are promised literal immortality, to the extent that they believe that living up to religious standards provide them a 'ticket' to heaven.

Several studies suggest support for a causal relationship of death with immortality strivings. Indeed, empirical research has provided evidence for the hypothesis that immortality strivings can function to assuage mortality concerns (Dechesne et al., 2003; Greenberg, Solomon, & Pyszczynski, 1997; Norenzayan, Hansen, & Atran, 2003; Ochsmann, 1984; Osarchuk & Tatz, 1973). For instance, in a study, Dechesne and colleagues (2003) led participants either to believe that there exists compelling evidence that a near death

experience points toward a form of existence after death, or participants read that near-death experiences are the result of a biochemical artifact. Participants who were led to believe in existence of an afterlife displayed relatively less defensive reactions, and furthermore, believed stronger in a unrealistic positive personality feedback scale, and finally, displayed less harsher punishment for moral transgressors, after mortality salience. Moreover, evidence was found that people were more inclined to believe in an afterlife after a psychological confrontation with death (see also Dechesne et al, 2002; Osarchuk & Tatz, 1973). When faced with existential concerns, people seek ways to achieve immortality (Norenzayan et al., 2003).

Although the previous research illustrates that mortality salience exerts influence on a wide range of attitudes and behaviors, no study has directly addressed the role of mortality reminders on people's desire for offspring. This is surprising since giving birth to a child seems to coincide with all the mechanisms that terror management theorists suggest, function to assuage mortality concerns. Having children can contribute to a sense of immortality, in both a literal and symbolic sense, and can help fortify a sense of meaning and self-worth. It seems reasonable then to conclude, that having children may function as part of the psychological defense system against existential concerns. Moreover, the desire for offspring is not merely another defense. Rather the desire for an offspring constitutes one of the most important of all human motivations, as the continuation of our species is dependent on it. As such, a desire for offspring may be connected to innate hard wired programs and function not only at a symbolic level but also at a pre-symbolic level. However, the main focus of Chapter 3 will be if a desire for offspring can function as a terror management mechanism.

In sum, a relevant hypothesis that surprisingly has not yet been addressed, is whether mortality concerns promotes a desire for offspring. In chapter 3, I will examine this hypothesis to a greater length and investigate the key hypotheses of a novel theoretical framework.

Losing or Using the Symbolic Self?

In their thought provoking article, Sedikides and Skrowonski (1997) argue that humans evolved with the unique capacity of symbolic self awareness. Symbolic self awareness refers to the linguistic and abstract representations of the self and how these representations are used for effective functioning in behavioral, affective and motivational domains (Sedikides & Skrowonski, 1997). The symbolic self has numerous adaptive advantages. For instance, the symbolic self enables people to reflect about themselves and relate their own behaviour to previous or future behavioral outcomes (Sedikides & Skrowonski, 1997). However, as been mentioned before, one of the downsides, of the evolved symbolic self might be that it supplied adult humans with the capacity to anticipate on their own demise. Although some primates show some mirror mediated self recognition and as such seem to have a sense of *objective* self awareness (Duval & Wicklund, 1973; Lewis 1992) it is extremely unlikely that primates (just as toddlers) ponder about their own mortality, simply because they lack the cognitive capacities that seem to underlie thoughts about one's own demise. Thus to be fully aware of the consequences of life and death a necessary condition seems to be what Sedikides and Skrowonski call, a sense of *symbolic* self awareness (1997).

It was previously discussed that according to TMT people use the same structure (the symbolic self) that gave rise to the problem (death awareness) in the first place. A logical hypothesis that was not considered so far is that if the symbolic self commenced the potential for death anxiety indeed, then ‘shutting down’ that same symbolic self should also avert the problem of death awareness. For instance, hypothetical we could live like an animal (or toddler) and never suffer existential worries because we are simply not aware of the problem in the first place. Thus, based on the aforementioned logical analysis it can be hypothesized that people ‘use’ or/ and ‘lose’ symbolic self awareness as strategies of existential regulation.

In Chapter 4, I will argue that a way to ‘lose’ the symbolic self might be the activation of pre symbolic mechanism. I hypothesize in Chapter 4 that the activation of pre-symbolic mechanism can reduce existential concerns. Moreover, I will bridge Objective Self Awareness theory (OSA; Carver, 1975; Silvia & Duval, 2001; Wicklund & Duval, 1971; Gollwitzer & Wicklund, 1985) and TMT and present a theoretical framework that allows to make specific predictions as to under what circumstances people either ‘use’ or ‘lose’ the symbolic self to manage existential concerns. Furthermore, I will discuss how the findings of Chapter 2, and Chapter 3 fit in the proposed theoretical framework. Finally, I will offer some speculations as to what constitutes optimal existential regulation.

Thus, in Chapter 4, I will present a novel theoretical framework that posits that people use pre-symbolic mechanism that reduce symbolic self awareness and as such can help to manage existential concerns.

Short Overview

Until now, it has been discussed that according to terror management theory (TMT; Solomon, Greenberg & Pyszczynski, 1991), people adhere to worldviews that provide a sense of meaning and which set the standards through which one can attain a sense of value (i.e., self-esteem) to manage existential concerns. However, in this dissertation it is argued that there are several arguments that justify the hypotheses that people make use of a more extended system to cope with existential concerns. Firstly, several results within the TMT seem to suggest that people make use of worldviews in a more flexible and social manner than one would expect based on the TMT conceptualization of worldviews. Second, based on evolutionary psychological theories (Baumeister & Leary, 1995) it can be hypothesized that pre-symbolic strategies, other than symbolic (worldviews) coping strategies, may help to manage existential concerns. Third, I will argue that since symbolic self awareness is at the heart of death awareness, people can regulate existential concerns by reducing symbolic self awareness.

Following the tradition of Kurt Lewin dissertations, each of the following Chapters comprises a published or submitted article and can be read on its own. I believe that the several topics that are discussed, affiliation, procreation strivings and the role of pre-symbolic mechanisms all comprise novel ideas and unique hypotheses, and each Chapter provides a separate contribution within the literature.

In chapter 2, it will be hypothesized that affiliation can function as mechanism against existential concerns. Moreover, I will test the idea that affiliation defenses can override worldview validation defenses. In chapter 3, I conjecture that reminders of mortality (mortality salience) should promote the desire for offspring to the extent that it does not

conflict with other self-relevant worldviews that also serve to manage existential concerns.

Finally, in chapter 4, I synthesize the findings of Chapter 2 and Chapter 3, and the theoretical framework of TMT, into a novel account of optimal existential regulation

CHAPTER 2

Hiding in the Crowd:

Can Mortality Salience Promote Affiliation

with Others Who Oppose One's Worldviews?[†]

At the beginning of World War II, all Dutch university professors were faced with a terrifying decision (Moore, 1997). The Nazi occupiers of The Netherlands had decreed that all Dutch public servants must provide a so-called “Aryan attestation”, a written declaration of their affiliation with the Aryan race. By effectively asking Jewish civil servants to identify themselves, this declaration was to facilitate the exclusion of the Jews from education, public office, and the economy. Even though The Netherlands enjoyed a longstanding tradition of tolerance towards ethnic groups (Schama, 1997), and most Dutch academics were condemning of anti-semitism, the Aryan attestation inspired only a few limited protests. Indeed, nearly all the teachers and academics did eventually sign the declarations. Historians nowadays agree that the lack of Dutch resistance to this policy was one of the key factors in the “efficiency” of the Nazi persecution of the Jews in The Netherlands, which culminated in the extermination of 102,000 out of a total of 142,000 Dutch Jews (Moore, 1997).

This dark and disturbing episode in the history of The Netherlands gives rise to some profound questions regarding human nature. Why do so many people seem willing to forsake their personal convictions when their own existence is threatened? One possibility is that most

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people are “moral hypocrites” (Batson, Kobryniewicz, Dinnerstein, Kampf, & Wilson, 1997) who pay no more than lip service to their ideological beliefs. As soon as their own life is on the line, people might begin to weigh their options extra carefully, and logically decide that their beliefs are not really worth dying for. Although we do not deny that rational thinking may be one important form of dealing with existential concerns (see Pyszczynski, Greenberg, & Solomon, 1999), the present research deals with a decidedly more irrational –but, as we believe, no less common- response to the psychological encounter with death. Specifically, we suggest that people’s concerns with their own vulnerability and mortality may arouse a deeply rooted, largely unconscious, desire to avoid being isolated from others. As a result, the psychological confrontation with death may lead people to side with the nearest social group –much like the Dutch professors did during World War II- even when this group advocates values that are contrary to people’s ideological beliefs.

In the remainder of this article, we will further examine the influence of existential concerns on affiliation with groups that either uphold or oppose one’s ideological beliefs. We begin by discussing Terror Management Theory (TMT; e.g., Greenberg, Solomon, & Pyszczynski, 1997), an influential theoretical perspective that has argued that people’s concerns with death may exert a powerful effect on their ideological allegiances and interpersonal affiliations. However, because TMT has considered ideological validation as primary to affiliation needs, the perspective is hard pressed to explain why people might choose to affiliate with a group that contradicts their ideology. Accordingly, to deepen our understanding of this issue, we will turn to recent research on interpersonal affiliation and attachment processes, which has argued for a distinct anxiety-buffering value of affiliation

(e.g., Mikulincer & Florian, 2001; Taylor et al., 2000). In previous discussions, terror management motives and affiliation needs have been put forward as mutually exclusive accounts of social motivation (e.g., Greenberg, Pyszczynski, & Solomon, 1990; Leary & Baumeister, 2000; Muraven & Baumeister, 1997). However, we will suggest that it is possible for both theoretical perspectives to be valid, to the extent that terror management needs may fuel the drive to affiliate with others (see Mikulincer & Florian, for a similar argument). After discussing these ideas, we present four Studies that were designed to test our theoretical analysis.

Terror Management Function of Cultural Worldviews

TMT has provided a groundbreaking analysis of how people's need to manage the fear of death becomes translated into social behavior (Solomon, Greenberg, & Pyszczynski, 1991; Greenberg et al., 1997; Pyszczynski et al., 1999). Based on the writings of existential thinkers like Kierkegaard, Rank, and Becker, TMT argues that death anxiety arises from the juxtaposition of an instinctual drive for self-preservation and the advanced intellectual ability to reflect on one's vulnerabilities and the inevitability of death. As such, death anxiety is seen as an inescapable aspect of the human condition, a form of anxiety that can only be controlled through a variety of social-symbolic defenses. Specifically, TMT posits that death anxiety is managed through a) adopting a system of socially shared values or cultural worldviews, which imbue life with order, meaning and permanence, and b) the perception that one lives up to the standards and values that are propagated by one's cultural worldviews, i.e., self-esteem. We will restrict our discussion to the worldview component of TMT, because this

aspect of the theory is most relevant in the present context (for a more complete discussion of TMT, see Greenberg et al., 1997).

According to TMT, a cultural worldview is “a shared conception of reality that imbues life with meaning, order, and permanence and the promise of safety and death transcendence to those who meet the prescribed standards of value” (Greenberg et al., 1997, p. 71). Thus, the anxiety-buffering function of cultural worldviews operates at the level of socially shared symbols: Cultural worldviews offer the hope of achieving symbolic immortality which then serves to control the terror that is aroused by the symbolic (i.e., psychological) confrontation with death. This presumed terror management function of cultural worldviews has been empirically tested in a systematic program of research. Most of this research has used the so-called mortality salience paradigm, in which mortality salience is manipulated (usually by asking two open-ended questions about death or a neutral topic), after which participants’ defense of their cultural worldviews is assessed. The rationale behind this research is that if cultural worldviews function as a psychological shield against death concerns, evoking these concerns should increase the need to defend those worldviews. In line with TMT, research using the mortality salience paradigm has found that worldview defense becomes increased under heightened mortality salience. For instance, mortality salience has been found to promote exaggerated consensus estimates for personally held opinions (Pyszczynski et al., 1996; Simon, Greenberg, Arndt et al., 1997), reliance on cultural stereotypes (Schimel et al., 1999), and reluctance to desecrate culturally cherished icons (Greenberg, Simon, Porteus, Pyszczynski, & Solomon, 1995).

Notably, most of the research that has been guided by TMT has operationalized worldview defense rather indirectly, by examining people’s evaluations of others who either

uphold or attack their cultural worldviews. From a terror management perspective, relationships with other people are primarily valued because they furnish a means of validating one's worldviews. In line with this, a number of experiments have shown that reminding people of their own mortality leads to more positive evaluations of others who praise or share their cultural worldviews (e.g., Greenberg et al., 1990; see Greenberg et al., 1997). Conversely, TMT predicts that people who fail to provide validation of one's worldviews will be much less valued or even derogated. Consistent with this, a number of experiments have shown that mortality salience leads to harsher judgments against individuals who violate people's moral principles or who attack their cultural worldviews (e.g., Arndt & Greenberg, 1999; Florian & Mikulincer, 1997; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). Moreover, a recent set of studies has extended these findings to actual behavior, by showing that mortality salience can promote aggression towards others who have threatened one's worldviews (McGregor et al., 1998).

Taken together, TMT research has yielded evidence that interpersonal evaluations are a direct function of the extent to which others serve as appropriate vehicles for worldview validation. As such, this line of research seems to leave no room for a separate anxiety-reducing role of interpersonal affiliation. After all, if affiliation in itself would be sufficient to combat death anxiety, one might expect that attitudes towards others would remain at least somewhat positive even when these others were perceived as threatening to one's cultural worldviews. However, it is important to note that prior TMT research was not explicitly aimed at pitting the anxiety-buffering role of affiliation against that of worldview validation. As a result, many of the obtained findings might still allow for an anxiety-reducing role of

interpersonal affiliation. For instance, in the majority of this research, the targets who attacked participants' worldviews were outgroup members (e.g., Arndt, Greenberg, Pyszczynski, & Solomon, 1997; Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992; Simon, Greenberg, Harmon-Jones et al., 1997). Other evidence for ideological distancing under heightened mortality salience has been obtained in the context of a distal, vaguely defined groups, e.g., "the general population" (Simon, Greenberg, Arndt et al., 1997). Because both outgroups and distal groups are unlikely to be regarded as potential relationship partners, distancing from the members of such groups is less likely to invoke feelings of social isolation (Baumeister & Leary, 1995). Consequently, finding that mortality salience promotes distancing from outgroup members or distal groups does not rule out the possibility that affiliation with ingroup members, or members of proximal groups, may assist in coping with existential threat.

Terror Management Function of Affiliation

In recent years, a number of researchers have begun to pay more explicit attention to the potential terror management functions of interpersonal affiliation. Notably, some of this work has evolved directly from TMT research. For instance, Harmon-Jones, Greenberg, Solomon, and Simon (1996; see Castano, Yzerbyt, Paladino, & Sacchi, 2002, for a replication) explored the influence of mortality salience in a minimal group setting. Following the classic minimal group paradigm (Tajfel, Billig, Bundy, & Flament, 1971), participants were assigned to ad hoc, artificial groups that were formed on the basis of a criterion that was clearly arbitrary (i.e., preference for a certain type of paintings). After this, participants were asked to ascribe positive and negative traits to the ingroup and outgroup. The results showed

that mortality salience led participants to be more biased towards their own minimal group. Given that the basis for group membership was deliberately designed to be arbitrary in this context, it seems hard to argue that belonging to such a group constituted an important aspect of participants' cultural worldviews (though see Harmon-Jones et al., 1996, for an alternative interpretation). In a related vein, Arndt, Greenberg, Solomon, Pyszczynski, and Schimel (1999) found that mortality salient participants who had engaged in a creativity task expressed higher levels of social projection, an index of perceived social connectedness. Based on these findings, Arndt et al. (1999, p. 21) suggested that "maintaining a sense of social connection serves the vital function of protecting individuals from concerns associated with mortality". As such, recent TMT research has begun to uncover some initial evidence for a terror management function of affiliation.

Another relevant line of research has focused on the role of attachment style in coping with existential concerns. One early study showed that chronic attachment style is an important moderator of the personal fear of death, with securely attached individuals displaying lower fear of death than insecurely attached individuals (Mikulincer, Florian, & Tolmacz, 1990). Following up on this work, Florian, Mikulincer and associates have demonstrated that chronic attachment style moderates symbolic terror management defenses (Florian & Mikulincer, 1998; Florian, Mikulincer, & Hirschberger, 2001; Taubman Ben-Ari, Findler, & Mikulincer, in press; Mikulincer & Florian, 2001). For instance, Florian and Mikulincer (1998) found that securely attached individuals reported a higher sense of continuity and lastingness, as assessed through the concept of symbolic immortality (Lifton, 1983). In another series of studies, only insecurely attached individuals were found to respond

to mortality salience by increased worldview defense (Mikulincer & Florian, 2001). By contrast, securely attached individuals were found to respond to mortality salience by increasing their desire for intimacy. Finally, Taubman Ben-Ari et al. (in press) reported that mortality salience led to more willingness to initiate social interactions, especially among securely attached individuals.

Based on these accumulating findings, Florian, Mikulincer and associates have recently proposed that interpersonal affiliation may form an anxiety-buffer that is functionally distinct from worldview defense. According to this argument, the condition of being affiliated with others creates a “haven of safety” (Mikulincer, Birnbaum, Woddis, & Nachmias, 2000, p. 509) in which people can feel safe and secure, even in times of severe distress (see also Bowlby, 1969, 1973). Importantly, affiliation is assumed to be mediated by different psychological mechanisms than worldview defense. Whereas worldview defense is presumably mediated by cultural-symbolic processes, the buffering function of affiliation may be mediated to a considerable degree by automatic subcognitive, biologically based mechanisms. From an evolutionary perspective, affiliation confers many important advantages on the individual, such as improved ability to gather food, increased likelihood of mating, and greater protection against threats in the environment (Baumeister & Leary, 1995; Buss, 1991; Sedikides & Skowronski, 1997). Given the important adaptive benefits associated with affiliation, it seems plausible that some powerful psychological mechanisms would have evolved to ensure that individuals maximize the association between themselves and their social group, and minimize the danger of becoming isolated or expelled from the group (Baumeister & Leary, 1995; Mikulincer et al., 2000; Taylor et al., 2000). The anxiety-

reducing function of affiliation might represent one of these mechanisms, by leading individuals to seek out the company of others under threatening circumstances.

Recent psychobiological work seems to fit with a direct, subcognitive anxiety-reducing impact of affiliation. Along these lines, animal research has found that affiliation behaviors in mammals result in notable changes in neuroendocrine responding. For instance, one study of squirrel monkeys showed that increased cortisol levels after mother-infant separation became reduced when mother and infant were reunited (Mendoza, Coe, Smotherman, & Levine, 1978). Other studies have found that infant rats that grow up with highly nurturing mothers show better regulation of somatic growth and neural development (Francis, Diorio, Liu, & Meaney, 1999). Analogous findings have been obtained in humans, for whom important hormonal and neurophysiological substrates of caregiving and attachment have been identified (Carter, Lederhendler, & Kirkpatrick, 1997; Reis, Collins, & Berscheid, 2000; Siegel, 1999; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Importantly, this line of research indicates that the mere presence of another individual may have direct emotional and neuroendocrinal buffering effects that operate independently of cognitive appraisal (House, Landis, & Umberson, 1988). For instance, securely attached individuals display less stress hormones than insecurely individuals in challenging circumstances (Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996). In a related vein, recent neuroendocrine evidence has implicated an oxytocin-based system as a biobehavioral mechanism that underlies the “tend-and-befriend” pattern in response to stress (especially among females, see Taylor et al., 2000). Taken together, these lines of research are consistent with the operation of a set of biologically based, subcognitive mediators in the distress-

regulating influence of affiliation. The subcognitive mediation of affiliation may be contrasted with worldview validation defenses, which are presumably mediated by higher brain functions that can support cognitive-symbolic processes (Pyszczynski et al., 1999). As such, converging evidence points to an anxiety-buffering role of affiliation that is functionally distinct from the cognitive-symbolic worldview defense mechanisms that have been explored by TMT researchers.

The Present Research and Hypotheses

In the preceding paragraphs, worldview validation and affiliation were proposed as two rather different ways in which people may protect themselves against existential threat. Presumably, worldview validation operates at the level of socially shared symbols, and controls death anxiety by offering the promise of symbolic immortality and death transcendence. By contrast, the anxiety-buffering function of affiliation may operate predominantly on a pre-symbolic level, through affective-behavioral mechanisms that unfold in close interaction with automatic neurophysiological processes. Although worldview validation and affiliation thus appear to be distinct terror management defenses, very little work has explicitly examined both kinds of defenses simultaneously (but see Mikulincer & Florian, 2001, for a recent individual difference approach to this topic). Moreover, we are not aware of any research that has directly examined the relative strength of these defenses, for instance, by pitting them against each other within a single experimental design. The present research was conducted to address these issues.

In the following series of Studies, we employed the mortality salience paradigm to examine the influence of existential concerns on affiliation behavior. In each Study, we

manipulated mortality salience, and subsequently examined participants' tendency to affiliate with a proximal social group. In Study 2.1-2.1, the beliefs that were espoused by this group were experimentally varied, to be either in line or in conflict with participants' cultural worldviews. For the ingroup that supported participants' worldviews, both TMT and affiliation theory predict that mortality salience leads to enhanced affiliation with the group. After all, affiliating with a worldview-validating ingroup would presumably serve to fulfill both participants' needs for worldview validation and their affiliation needs. By contrast, worldview validation and affiliation needs are in conflict when the ingroup propagates beliefs or values that are contrary to participants' cultural worldviews. In Study 2.3 we presented participants even more directly with this conflict, by explicitly asking them to choose between either sitting alone and defending their own worldviews, or sitting in the group and attacking their own worldviews.

Based on prior TMT research, one might expect the need for worldview validation to prevail, and thus predict that mortality salience should lead to decreased affiliation in situations when affiliation represents a threat to worldview validation. However, as noted before, this line of research has primarily examined reactions towards outgroup members or distal groups, and may thus have allowed little room for the emergence of affiliation defenses. From the perspective of affiliation theory, affiliation defenses are most likely to become activated when people are interacting with concrete members of the ingroup. Hence, given that the present research was conducted in an ingroup setting, we anticipated that affiliation defenses would be more influential in the present context than in previous TMT research. Accordingly, mortality salience might enhance participants' tendency to affiliate with their

own social group, even when affiliating with the group was threatening to participants' cultural worldviews.

Study 2.1

Study 2.1 examined affiliation defenses in a context in which the nearest social group consisted of a concrete, rather accidental collection of individuals. Specifically, participants were first reminded of death, and were then offered an opportunity to affiliate with a group of research participants with whom they would supposedly engage in a group discussion. Because these other participants did not form a very meaningful social category, it seemed unlikely that affiliation with such a haphazard collection of individuals would provide a strong boost to participants' cultural worldviews. By contrast, even a social environment completely devoid of cultural symbolism might still be suitable for the operation of affiliation defenses, given that affiliation defenses are presumably mediated by sub-cognitive mechanisms (Baumeister & Leary, 1995; Taubman Ben-Ari et al., in press; Kuhl, 2001). Accordingly, we assessed our participants' affiliation defenses by adapting the so-called seating paradigm, a classic methodology within the social-psychological literature (e.g., Macrae, Bodenhausen, Milne, & Jetten, 1994; Pleban & Tesser, 1981; Schachter, 1959; Tice, 1992). By and large, this literature indicates that individuals tend to maintain a closer seating distance towards others with whom they would like to affiliate. As such, the seating paradigm provided us with a subtle, well-validated behavioral measure of affiliation. More specifically, we arranged for a room in which participants could either sit down alone (i.e., on a single chair) or among the other participants (i.e., on one of three chairs that were arranged in a cluster), and surreptitiously observed where the participants chose to sit. Assuming that mortality salience would arouse participants' affiliation defenses, we could expect to find a

more pronounced preference for sitting down in the group over sitting down alone under heightened mortality salience.

Study 2.1's main theoretical focus was the interplay between affiliation and worldview validation defenses. We created a conflict between both kinds of defenses by manipulating whether participants' fellow group members supported versus attacked their cultural worldviews. Specifically, participants were either told that the personality dispositions of their group discussants were very tolerant or that the discussants' dispositions were not very tolerant at all. Because tolerance is one of the most revered values in the culture of The Netherlands (e.g., Schama, 1997), we expected that this manipulation would significantly alter participants' perceptions of the degree to which their fellow discussants supported their cultural worldviews. Accordingly, from a TMT perspective, the effects of mortality salience on affiliation behavior should be moderated by the ideological stance that was taken by participants' fellow group members: Mortality salience should promote affiliation when group members were described as having tolerant worldviews but not when group members were described as having intolerant worldviews. On the other hand, an affiliation perspective might predict only a main effect of mortality salience on affiliation behavior, given that the entire social interaction took place within an ingroup context.

After participants were seated, we collected some more conventional paper-and-pencil measures of worldview defense. Specifically, we provided them with two essays, one that criticized, and another one that praised Dutch cultural values. Worldview defense was operationalized as a pro-Dutch bias in participants' evaluations of the authors of the essays. We chose to focus on author evaluations because past research suggests that this measure is a

particularly sensitive measure of worldview defense (Simon, Greenberg, Harmon Jones et al., 1997). In a rather exploratory vein, our analyses of this worldview defense measure also included participants' seating position (i.e., alone or in the group). Theoretically, worldview defense might be especially pronounced among participants who had chosen to sit alone, as these participants' behavior would seem to imply that their reliance on affiliation defenses was weaker (see Mikulincer & Florian, 2001). Alternatively, mortality salience might evoke such a powerful need for worldview validation that participants' affiliation status (i.e., their seating position) would not moderate the emergence of worldview validation defenses.

Method

Participants and Design. Seventy-two undergraduate students from the University of Nijmegen (49 women and 23 men¹, average age 22) were randomly assigned to a 2 (mortality salience: high vs. low) x 2 (tolerance of the ingroup: high vs. low) between-subjects factorial design. Participants received Dfl. 5,- (around 2 US dollars) for their participation.

Procedure and Materials. Upon arriving at the laboratory, participants were welcomed and escorted to small cubicles, each containing an Apple Macintosh computer. The experimenter (who was blind to the experimental conditions) explained that a short group discussion was to be part of the current investigation, and pointed out the room where this discussion was to take place. All the remaining instructions were administered via the computer screen. Participants were first informed that they would fill out some personality questionnaires during the first part of the investigation. Based on these questionnaires, the computer would calculate which scores were applicable to the participants themselves and the other participants who were to take part in the group discussion. It was explained that during

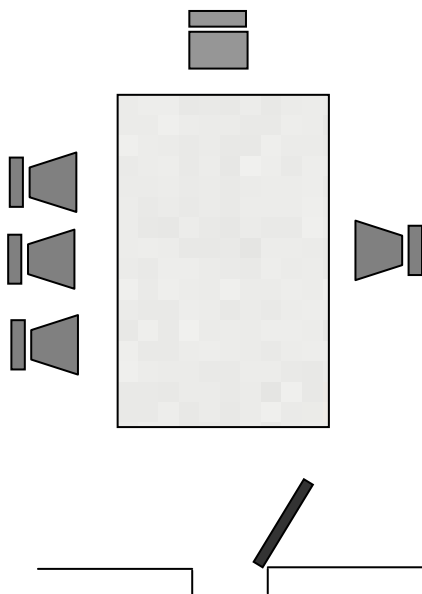
the second part of the investigation, participants would be able to give their own opinion about the essays, followed by a group discussion about the essays. In reality, this group discussion did not take place; indeed, the experiment was run for each participant individually. After the most important measures were collected, participants were informed that the group discussion was cancelled.

The next part was described as a research into personality and consisted of a few filler questionnaires that were followed by the mortality salience or television-control manipulation. This manipulation was closely patterned after previous TMT research (e.g., Greenberg, et al., 1990; Rosenblatt et al., 1997). Specifically, participants in the mortality salience condition were asked to respond to the following two open-ended questions: 1) Describe the emotions you feel while you are thinking about your own death; 2) Describe what you think will happen to you when you physically die. Control participants responded to two parallel questions in which the words "own death" were substituted by the words "watching television". Immediately following the mortality salience treatment, participants rated their current feelings on the 20-item Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS were scored on 5-point scales (1 = not at all; 5 = very much).

Next, participants were informed that the personality scores of themselves and the other members of the discussion group had become available. Participants were told that it was important for them to remember these scores in light of the upcoming group discussion. The personality scores then appeared on the computer screen. Participants in the tolerant group condition read: 'Zero out of four participants had a low score on the tolerance scale'.

Participants in the intolerant group condition read: ‘Three out of four participants had a low score on the tolerance scale’. Note that the intolerant feedback still allowed room for the participants to consider themselves as having a tolerant personality. After receiving the feedback, participants were instructed to take with them a closed envelope placed next to the computer, and walk to the adjoining discussion room. The experimental sessions were scheduled in such a way that each participant did not meet other participants in the discussion room. The discussion room was furnished with a rectangular table and five chairs (see Figure 1).

Figure 1: *Schematic representation of the discussion room (Study 2.1).*



Note: The chairs on which the participants could sit down were either placed to the left or to the right of the table (the rectangle in the above figure). The placing of the clustered chairs and the single chairs was counterbalanced across conditions. The interviewer’s chair was placed at the far end of the table.

On the far end of the table, there stood one big-armed chair (presumably, this chair would be occupied by the group interviewer). On one long side of the table, three chairs were placed next to each other; on the other long side of the table, there stood only one chair. As soon as participants had taken their seats, the experimenter unobtrusively recorded participants' seating position (1 = the single chair; 2 = one of the three clustered chairs).

While they were waiting for the other discussants, participants were asked to complete a packet of questionnaires that was in the envelope they had brought with them. These questionnaires consisted of a paper-and pencil measure of worldview defense that was modeled after Greenberg et al. (1992).

Specifically, participants read two essays, which had been supposedly written by foreign students staying in The Netherlands. One of the essays delivered criticism, whereas the other essay delivered praise to Dutch culture. The anti-Dutch essay criticized Dutch tolerance for drugs, sex, and violence, and the soft attitudes towards ethnic minorities of the Dutch authorities. The essay concluded by stating that "I am glad that I will leave this country again because I don't think that it's possible for anyone to become happy around here". The pro-Dutch essay was similar in length, but conveyed a highly favorable attitude towards living in The Netherlands. Although the latter essay granted that -like any other country in the world- The Netherlands has a few negative sides, it lavishly praised the freedom, education, and welfare system that characterize The Netherlands. The essay concluded that "we should be proud of the fact that people in The Netherlands live in a very democratic and tolerant country".

Each essay was followed by two questionnaires that assessed participants' evaluations of the authors of the essays. The first questionnaire was modeled after the Interpersonal Judgement Scale (IJS; Byrne, 1971; see Greenberg et al., 1990), and asked participants to provide general evaluations of each author. Representative items are "To what extent do you think this person is prejudiced?" and "Would you like to meet this person?". The second questionnaire requested participants to rate to what extent a series of traits applied to the author of each essay. The items of the second questionnaire were translated from Greenberg et al. (1990) and consisted of 15 positive traits and 15 negative traits, presented in a random order. All the items were rated on 9-point scales (1=not at all, to 9= very much). As soon as participants had completed the worldview defense measure, the experimenter entered the discussion room and informed them that the group discussion had been cancelled. Finally, participants were probed for suspicion, debriefed, paid, and dismissed.

Results

Manipulation Checks. Almost all of the participants (96.2%) were able to recall the personality feedback regarding the tolerance of the discussion group. The three participants (3.8 %) who had difficulty remembering the personality feedback were excluded from the analyses reported below. Four additional participants (5.1 %) accidentally ran into each other when they went into the discussion room. These participants were also excluded from the analyses².

Self-Reported Affect. A 2 (mortality salience: high versus low) x 2 (group tolerance: high versus low) multivariate analysis of variance (MANOVA) was conducted on the subscales of the PANAS. As before, no reliable effects emerged.

Seating Position. Participants' seating positions were subjected to a 2 (mortality salience: high vs. low) x 2 (group tolerance: high vs. low) x 2 (seating position: single chair vs. clustered chair) logistic regression analysis. This analysis revealed a significant seating position by mortality salience interaction, $\chi^2(1, N = 72) = 10.76, p < .005$. As shown in Table 1, a large majority of the participants (79%, $N = 28$) in the high mortality salience condition chose to sit in one of the clustered chairs. In contrast, less than half of the participants (46%, $N = 17$) in the low mortality salience condition preferred to sit in a clustered chair. No effects were found for group tolerance nor for the interaction between group tolerance and mortality salience, both p 's $> .2$.

Table 1

Seating preference as a function of mortality salience and Pro-Netherlands bias as a function of mortality salience and seating position (Study 2.1).

Mortality salience	Preferred seat	
	Single chair	Clustered chair
Low	N= 20 (54 %)	N= 17 (46 %)
High	N= 7 (21%)	N= 28 (79%)

Note. $N = 72$.

Worldview Defense. We only report the results for the IJS, because these were highly similar to the results obtained for the trait rating measure. A component factor analysis showed that the five items of the IJS loaded .6 or higher on a single factor. After recoding reverse-scored items, the items were summed and averaged. A composite measure was then constructed by subtracting participants' mean evaluations of the anti-Dutch author from participants' mean evaluations of the pro-Dutch author, such that higher means indicated a stronger pro-Dutch bias.

Table 2

Pro-Netherlands bias as a function of mortality salience and seating position (Study 2.1).

Mortality salience	Seating position	
	Single chair	Clustered chair
Low		
<i>M</i>	0.86	2.22
<i>SD</i>	1.5	1.7
High		
<i>M</i>	2.00	1.10
<i>SD</i>	1.9	1.9

Note. $N = 72$.

Because we anticipated that participants' seating position might have influenced their tendency to engage in worldview defense, we included seating position in the analysis as an

independent variable. It should be noted that seating position was not a manipulated but a measured variable, so that any effects involving seating position should be interpreted with great caution. We proceeded by analyzing the worldview defense measure in a 2 (mortality salience: high vs. low) x 2 (group tolerance: high vs. low) x 2 (seating position: single chair vs. clustered chair) between subjects analyses of variance (ANOVA). Relevant means are displayed in Table 2. This analysis revealed a significant mortality salience by seating position effect, $F(1, 64) = 5.25, p \leq .0325, d = 0.76$.

As can be seen in Table 2, the classic worldview defense pattern of greater pro-Dutch bias under high versus low mortality salience was obtained among the group who had chosen to sit in the single chair ($M = 2.0; SD = 1.8$ vs. $M = 0.86; SD = 1.4$). By contrast, the clustered chair group showed a trend in the opposite direction, with less pro-Dutch bias occurring under high mortality salience than under low mortality salience ($M = 1.1; SD = 1.9$ vs. $M = 2.22; SD = 1.7$). Thus, there was some indication that the emergence of ideological defenses was systematically related to participants' seating position.

Discussion

Consistent with recent reports in the literature (Arndt et al., 1999; Harmon-Jones et al., 1996; Mikulincer & Florian, 2000), Study 2.1 found evidence for a terror management function of ingroup affiliation. Specifically, the results showed that mortality salience led to increased affiliation strivings, as indicated by a greater preference to sit in the group as opposed to sitting alone. Moreover, this form of affiliation defense was not qualified by whether or not the group members supported participants' cultural worldviews.

Notably, Study 2.1 yielded suggestive evidence that at least some participants engaged in worldview defense. That is, the essay measure of worldview defense revealed that mortality salience led to increased worldview defense among participants who had chosen to sit alone, but not among participants who had chosen to sit down in the group. Because this finding is correlational, its interpretation is somewhat ambiguous. One possibility is that affiliation and worldview validation defenses can psychologically compensate for each other (see Koole et al., 1999; Tesser, 2001). This notion would be compatible with recent research by Mikulincer and Florian (2001), who found that worldview validation defenses are less prevalent among securely attached individuals. It could be, then, that affiliation defenses possessed substitution value for worldview validation defenses, such that participants who had engaged in one kind of defense no longer needed to engage in the other kind of defense.

However, another possibility is that our seating position measure was confounded with personal importance of tolerance. Specifically, participants who had chosen to sit down among a group of intolerant discussants might have done so because they had not fully internalized the Dutch cultural value of tolerance. By this reasoning, tolerance may have mattered only for participants who had chosen to distance themselves from the intolerant group, so that only these individuals could use tolerance as a terror management defense. From a socio-cultural perspective, this would be remarkable, given the widespread consensus among social scientists that tolerance represents one of the core values in Dutch society (e.g., Schama, 1997; Moore, 1997). Moreover, some earlier research suggests a general tendency among our sample to rely on tolerance as a terror management defense (Koole & Dechesne, 2000). Nevertheless, prior TMT research has pointed to the existence of substantive individual differences in the importance that people place on tolerance (Greenberg

et al., 1992). Even though the latter research was conducted in the United States, it cannot be ruled out that similar individual differences were influential in our sample of Dutch university students.

Notably, in the tolerant group condition, seating position was presumably unable to differentiate between individuals for whom tolerance was important and those for whom tolerance was unimportant. Consequently, the lack of an interaction between mortality salience, seating position and group tolerance would seem to argue against an individual difference account. Then again, the lack of such an interaction effect might not be terribly informative, given that the present research may have possessed insufficient power to obtain this three-way interaction. Indeed, a great deal of statistical power would have been needed to test this interaction, given the paucity of alone-sitting participants in the high mortality salience conditions. In light of these considerations, it seemed important to control more thoroughly for the personal relevance of the particular cultural worldviews that were studied in opposition to participants' affiliation defenses. Study 2.2 was specifically designed for this purpose.

Study 2.2

Study 2.1 found some strong initial evidence for the emergence of affiliation defenses, but the evidence for worldview validation defenses was relatively weak. As such, the obtained findings are at odds with prior TMT research, which has found consistent evidence for the potency of worldview validation defenses (Greenberg et al., 1997). One conspicuous difference between the present research and prior TMT research lies in the specific worldviews that were being investigated. In Study 2.1, we operationalized worldview defense

as the willingness to defend the Dutch cultural value of tolerance. By contrast, most TMT research has demonstrated that people become more narrow-minded when they are confronted with existential concerns (see Greenberg et al., 1997). Moreover, experimental evidence that this tendency can be moderated by personal adherence to tolerant values is rather limited (Greenberg et al., 1992). Accordingly, there could something about tolerance that renders it less suitable as a terror management device. If this is correct, Study 2.1 might have stacked the deck against worldview validation defenses by focusing exclusively on the defense of tolerant worldviews.

The primary goal of Study 2.2 was to come up with a more potent method of ensuring that participants were highly motivated to defend the worldviews that were being threatened by their group. To accomplish this, we first conducted a pretesting session in which we screened which worldviews were most important to each participant. After this, we adapted our materials and procedures for a follow-up session to participants' idiosyncratic worldviews. Accordingly, each participant's personally most important worldviews were the focus of the actual experiment. Combined with the seating distance methodology from Study 2.1, we hoped that this paradigm would make for a more powerful way of gauging the relative importance of affiliation and worldview validation defenses.

Method

Participants and Design. Eighty undergraduate students from the University of Nijmegen (62 women and 18 men, average age 21) were randomly assigned to a 2 (mortality salience: high vs. low) x 2 (group views: like-minded vs. different-minded) between-subjects factorial design. Participants received Dfl. 10,- (about 4 US dollars) for their participation.

Procedure and Materials. Two weeks prior to the experiment participants were recruited for a pre-testing session. The researchers explained to the participants that the pre-testing was necessary for the second part of the study and that they would only receive payment if they completed both sessions.

During the pre-testing session, participants filled out a Dutch translation of the Study of Values scale (Allport, Vernon, & Lindzey, 1960; see Koole et al., 1999), also known as the AVL-scale. The AVL-scale is concerned with people's values in six major life domains: aesthetics (appreciation of the fine arts and literature), social (interest in caring for others and human rights), political (interest in power and influence in society), religion (interest in theology and church matters), economics (interest in business and finances), and science (interest in scientific theory and research). The AVL-scale assesses the relative importance of these six values, by asking people to choose between options that each time pit two different values against each other. An example item is: "Who contributed the most to the improvement of humanity? a) Sir Isaac Newton, or b) Martin Luther King?" Choosing option a) would be scored as a relative preference for the value of science, whereas choosing option b) would be scored as a relative preference for social values. Across the 30 items of the AVL-scale, each of the different value combinations was tested twice. The importance of each value was determined by counting the number of times each value was preferred over one of the other values. For each participant, the highest scoring value was taken to be the most important aspect of her or his worldview.

During the experimental session, held about two weeks later, participants were once again welcomed by the experimenter (who was blind to the experimental conditions) and

escorted to one of the cubicles. As in Study 2.1, the experimenter explained that a short group discussion was part of the research, and pointed out where the discussion was to take place. All the remaining instructions were administered via the computer screen. Participants were informed that they would fill out some questionnaires that were followed by a short group discussion. Participants then answered some filler personality questionnaires, followed by the mortality salience manipulation and the PANAS. After this, participants were reminded of the questionnaire that they had filled out two weeks before. They were told that this questionnaire had assessed how much six different values meant to them: economy, religion, science, social involvement, arts and politics. Moreover, participants were informed that the experimenter had determined which one of these values was most important to each participant. Following this, participants in the similar-minded group condition read, “For the upcoming group discussion, you have been assigned to a group of students who value exactly the same category as you’. Participants in the different-minded group condition read. “For the upcoming group discussion, you have been assigned to a group of students who place a negative value on your category’. Subsequently, all participants were instructed to go to the discussion room and wait for the other group members. As in Study 2.1, we scheduled the experiment such that participants could not run into each other or actually meet in the discussion room. Also as in Study 2.1, the discussion room was furnished with a table with a big-armed chair on the far end, and a single chair and three clustered chairs on each side. Participants’ seating preferences were again covertly scored by the experimenter.

While the participants were waiting for the other group members, they filled out a number of questionnaires that were constructed to assess worldview defense. In these questionnaires, participants were asked to answer some questions regarding two brief essays.

One of these two essays always argued in favor of a particular value that was taken from the AVL-scale. Six different versions of this essay were used, one corresponding to each value of the AVL-scale. For instance, the pro-science essay read as follows:

“Many people seem to underestimate the importance of science. In my opinion, science forms the basis of human civilization. Indeed, science must be the most fundamental thing that distinguishes between humans and other animal species. For example, if you look at the past, you will see that science has determined the level of development of every civilization. A culture without science is unthinkable and doomed to be lost in oblivion. For me personally, science gives meaning to my life and allows me to develop my personality.”

For each of the other five versions of the value-supportive essay, the word “science” was substituted by a different value of the AVL-scale (art, economy, social commitment, ethics, or religion). Each participant received the version of the value-supportive essay which corresponded to her or his most important value, as assessed by their AVL-scale scores during the pretesting session. The other essay was the same for all participants and argued against all forms of cultural meaning. Specifically, the value-threatening essay argued:

“Economy, art, politics, science, all of these amount to the same thing. Everything is just religion, and religion is a human illusion that we need in order to escape our anxiety. We simply cannot deal with the fact that we are nothing more than animals.

Eating, drinking, and putting babies on this world, that's what it's all about, the rest is foolishness and only leads to misery. People should accept the fact that everything is absolutely meaningless.”

Each essay was followed by a series of questions about participants' evaluations of the author. Five of these questions were based on the Interpersonal Judgement Scale (IJS; Byrne, 1971), the two remaining questions were concerned with participants' global evaluations of the essay (see Greenberg et al., 1990), “To what extent does this essay appeal to you?” and “Does this essay affect you in a positive or negative manner?”. Both questions were scored on 9-point scales (from 1 = not at all, to 9 = very much; or from 1 = very negative, to 9 = very positive). After participants had evaluated the authors of both essays, the experimenter entered the discussion room and announced that the group discussion was cancelled. Finally, participants were carefully probed for suspicion, debriefed, paid, and dismissed.

Results

Manipulation Check. During the debriefing, almost all participants (91%) correctly recalled with which other participants (i.e., similar-minded or different-minded) they were to have a group discussion. Eight participants (9%) who expressed uncertainty regarding this issue were excluded from the analyses below.

Self-Reported Affect. A 2 (mortality salience: high vs. low) x 2 (group values: same as vs. different from self) multivariate analysis of variance (MANOVA) was conducted on both subscales of the PANAS. This analysis revealed a significant interaction between the group value manipulation and positive mood, $F(1, 76) = 4.28, p < .05, d = .058$. This effect indicated that participants experienced more positive feelings when they expected to hold a

discussion with a similar-minded group than when they expected to hold a discussion with a different-minded group ($M = 3.0$; $SD = 0.6$ versus $M = 2.71$; $SD = 0.6$ respectively). No significant effects regarding mortality salience were found, p 's $> .5$. Moreover, repeating the analyses reported below with mood as a covariate did not alter any of the results.

Seating Position. Participants' seating positions were subjected to a 2 (mortality salience: high vs. low) \times 2 (group values: same as vs. different from self) \times 2 seating position (single chair vs. clustered chair) logistic regression analysis. This analysis revealed a significant seating position by mortality salience effect, $\chi^2(1, N = 80) = 4.29, p < .04$.

Table 3

Seating preference as a function of mortality salience (Study 2.2).

Mortality salience	Preferred seat	
	Single chair	Clustered chair
Low	N = 21 (52 %)	N = 19 (48 %)
High	N = 12 (30%)	N = 28 (70%)

Note. $N = 80$.

As Table 3 shows, most of the participants (70%; $N = 28$) in the high mortality salience condition chose to sit in one of the clustered chairs. In contrast, less than half of the participants (48%; $N = 19$) in the control condition preferred one of the clustered chairs over the single chair. In addition, the analysis yielded a significant interaction between seating position and the group values manipulation, $\chi^2(1, N = 80) = 5.93, p < .02$. The participants who expected to meet with different-minded discussants showed a much greater preference for the clustered chairs (73%; $N = 27$) than the participants who expected to meet with similar-minded discussants (46%; $N = 20$). Finally, as in Study 2.1, the three-way interaction between seating position, mortality salience, and group values was nonsignificant, $\chi^2 < 1$.

Worldview Defense. In a preliminary factor analysis, the five IJS items and the two essay evaluation questions were found to load on a single factor (loadings $> .6$). Accordingly, these items were appropriately scored and averaged into a single index (Cronbach's alpha $> .83$). Next, a composite measure was constructed by subtracting mean evaluations of the value-threatening essay from mean evaluations of the value-supporting essay. Higher means on this index indicate greater worldview defense.

As in Study 2.1, we initially included participants' seating position as a correlational factor in the analysis of worldview defense. However, because this analysis revealed no significant effects involving seating position, seating position was removed from the analysis³.

Accordingly, we proceeded to analyze the worldview defense index by means of a 2 (mortality salience: high vs. low) \times 2 (group values: same as vs. different from self) between-subjects ANOVA. As shown in Table 4, this analysis yielded a mortality salience by group values interaction, $F(1, 76) = 5.19, p < .03, d = 0.64$. Specifically, under high mortality salience, participants displayed more worldview defense when they expected to meet a

different-minded group than when they expected to meet a similar-minded group ($M = 2.71$; $SD = 2.0$ versus $M = 1.49$; $SD = 2.1$, respectively).

Table 4

Pro-worldview bias as a function of mortality salience and group values (Study 2.2).

Mortality salience	In-group view	
	Dissimilar-minded	Similar-minded
Low		
<i>M</i>	1.68	2.60
<i>SD</i>	1.8	2.3
High		
<i>M</i>	2.71	1.49
<i>SD</i>	2.0	2.1

Note. $N = 80$.

By contrast, in the neutral condition, participants displayed somewhat less worldview defense when they expected to meet a different-minded group than when they expected to meet a similar-minded group ($M = 1.68$; $SD = 1.8$ versus $M = 2.60$; $SD = 2.4$, respectively). Separate tests revealed that the effect of group values was marginally significant under high mortality salience, $t(1, 76) = 3.51$, $p = .07$, $d = .085$ but non-significant in the control

condition, $t(1, 76) = 1.38$, $p > .16$, $d = .046$. Consequently, the interaction was mainly driven by the effect of group values in the high mortality salience condition.

Discussion

Given the rather weak emergence of worldview validation defenses in Study 2.1, Study 2.2 made a concentrated effort to ensure participants' motivation to defend their cultural worldviews. Specifically, participants were given the choice to affiliate or not with a group that either validated or threatened a major life value that they had rated as being uniquely important to them. In spite of these precautions, the effects of mortality salience on affiliation were again unqualified by the values that were supported by the group. Mortality salience simply led to a greater preference to sit down in the group, regardless of whether the group supported participants' personal values or not. As such, Study 2.2 provides a further indication that affiliation defenses may take precedence over worldview validation defenses in coping with existential threat.

Notably, participants did show evidence of being systematically affected by the group values manipulation. First, participants who expected to meet with a different-minded group reported being in a less favorable mood than participants who expected to meet with a similar-minded group. Second, participants who expected to meet with a different-minded group showed a greater preference for sitting down in the group than participants who expected to meet a similar-minded group. Conceivably, these participants sought to avoid a direct confrontation with a different-minded group (which, presumably, was experienced as more threatening) by choosing to sit down among this group. Conversely, participants may have felt more at ease by the prospect of interacting with a similar-minded group, and were

therefore more comfortable with the notion of sitting alone. Consistent with the latter interpretation, mortality salience elicited more worldview defense on our paper-and-pencil measure in the different-minded group condition than in the similar-minded group condition. Conceivably, the prospect of being in a similar-minded group served to alleviate some of participants' existential concerns, and thereby rendered further worldview defense unnecessary. Regardless of which interpretation is more accurate, both interpretations suggest that our manipulation of group values was powerful enough to elicit significant changes in participants' seating behavior. Moreover, the obtained findings confirm the validity of the seating paradigm as a sensitive measure of affiliation defenses.

Interestingly, the results on our paper-and-pencil measure of worldview defense were not qualified by participants' self-chosen seating position, as they had been in Study 2.1. Possibly, the worldview threat manipulation had more impact in Study 2.2, so that affiliation defenses were less able to substitute for worldview validation defenses. Alternatively, our design might have succeeded in ruling out the influence of individual differences in the importance of the worldviews that were being threatened. Methodologically, both of these interpretations imply that our efforts to provide a more powerful operationalization of worldview defense were at least somewhat successful. From a theoretical point of view, the findings of Study 2.2 are consistent with a functional dissociation between affiliation and worldview validation defenses, as both defenses appeared to operate simultaneously without canceling each other out. Although this possibility seems intriguing, the findings of Study 2.2 still seem open to alternative explanation. Study 2.3 was carried out to resolve some remaining ambiguities.

Study 2.3

If participants were willing to defend their own worldviews even when they chose to sit within a worldview-threatening group, then what does participants' seating preference tell us about the relative strength of affiliation and worldview validation defenses? As we have argued before, it seems plausible that participants' seating preference was driven by unconscious affiliation mechanisms that operated somewhat independently of worldview validation defenses. However, it could also be that participants chose to sit within the worldview-threatening group because they wanted to persuade this group of skeptics of the correctness of their own beliefs. From the latter perspective, participants' affiliations with worldview-threatening groups could be reinterpreted as a more vigorous pursuit of worldview validation concerns, or a kind of "defensive zeal" (McGregor, Zanna, Holmes & Spencer, 2001). If this were indeed the case, our findings in Study 2.1-2 would once again be squarely in support of the primacy of worldview validation, as TMT has advocated.

To clarify these alternative interpretations, we designed a final Study that provided an even more explicit confrontation between affiliation and worldview validation defenses. Specifically, we presented participants with the dilemma of choosing between either sitting alone and defending their own worldviews or sitting in the group and attacking their own worldviews. If, consistent with TMT, participants' desire to sit within the group was motivated by concerns with worldview validation, then mortality salience should produce a greater preference for defending one's own worldviews, even if this means sitting alone. Alternatively, if participants' seating preference was motivated by affiliation strivings, then

mortality salience should yield a greater preference for sitting in the group, even when this means that participants would have to turn their back on their own worldviews.

Method

Participants and Design. Fifty-eight undergraduate students from the Free University Amsterdam (40 women and 18 men, average age 22) were randomly assigned to the high or low mortality salience conditions. Participants received Dfl. 7.5 (about 3 US dollars) for their participation.

Procedure and Materials. Upon arrival in the laboratory, participants were greeted by an experimenter (who was blind to the experimental conditions) and led to separate cubicles, each containing an Apple Macintosh computer. The remaining instructions were administered via the computer screen. It was first explained that the research consisted of a number of separate studies. Participants then moved on to the first study, which was similar to the first part of Study 2.1-2.2. Participants answered some filler personality questionnaires, followed by the mortality salience manipulation and the PANAS.

Participants continued with the second study, which was described as an investigation of discussion methods. Supposedly as part of this investigation, they would partake in a group discussion with a minimum of 3 and a maximum of 8 discussants. This group discussion was to take place in a separate discussion room at the end of the session. During the group discussion, each discussant would be requested to defend a worldview that was either congruent or incongruent with her or his personal worldviews. Furthermore, it was explained that the researchers were interested in studying the influence of the number of discussants and their seating positions. Accordingly, the computer would randomly determine the number of

discussants for the group discussion, the arrangements of the seats, and which worldviews have to be defended for each of the different seats. As a result of this, when participants would choose a particular seat, they would be required to defend a particular opinion that was either congruent or incongruent with their own worldviews. To reduce self-presentation concerns, it was stressed that the researchers were not so much interested in participants' seating decisions or their worldviews, but rather in studying how well the discussants would listen to the arguments given by the different group members. To familiarize participants with the procedures, the participants would be given a few sample seating arrangements.

Participants were then presented with two consecutive screens that each displayed two different seating arrangements. For each display, the computer screen showed a two-dimensional diagram of a rectangular table as viewed from above. In each diagram, the long sides of the table were displayed horizontally and the short sides of the table were displayed vertically relative to the computer screen. In sample arrangement 1, both seating alternatives allowed participants to sit next to other group members. In the first seating alternative, participants would be required to defend an opinion that was in line with their own worldviews, whereas in the second seating alternative, participants would be required to defend an opinion that was at odds with their own worldviews. In sample arrangement 2, the first seating alternative allowed participants to sit next to others and required participants to defend an opinion that was in line with their own worldviews. By contrast, the second seating alternative would mean sitting alone and required participants to defend an opinion that was at odds with their own worldviews. It should be noted that for both example presentations, sitting in the group could be combined with defending own worldviews, so that it was possible to avoid any conflict between affiliation and worldview validation. After viewing

each diagram, participants were requested to choose between two seating alternatives. It was emphasized that these decisions would be made only for the purpose of practicing, and that they were non-binding with respect to participants' actual seating position.

Following the two sample arrangements, participants were told that the computer was about to make contact with the server in order to generate the actual seating arrangement. An hourglass appeared on the screen for seven seconds, after which the final table diagram was displayed. This diagram depicted a single chair on one long side of the table and three clustered chairs on the other long side of the table. Participants were subsequently given the choice between either sitting on the single chair and defending an opinion that was in line with their own worldviews or sitting on one of the three clustered chairs and defending an opinion that was at odds with their own worldviews. Thus, this decision involved the critical dilemma between affiliation and worldview validation. As before, participants indicated their decision by typing their response into the computer. After stating their preferred seating position, participants moved on to an unrelated investigation. Finally, the participants were probed for suspicion, extensively debriefed, paid and dismissed..

Results

Manipulation check. During the debriefing, 96.7 % of the participants indicated no suspicions regarding the goals or content of the Study. The data from two participants (one in each experimental condition) were removed from the data set because they had indicated suspicion about the experimental procedures during the debriefing

Self-Reported Affect. A one-way (mortality salience: high versus low) ANOVA was conducted on the two sub-scales of the PANAS. As in Study 2.1-2, this analysis revealed no significant results, both p 's $> .7$.

Non-Binding Seating Decisions. Although participants' decisions during the example items were explicitly presented as non-binding, they might still be revealing of participants' readiness to defend their own worldviews. Indeed, prior TMT research suggests that worldview validation defenses may even emerge for activities that represent no more than a symbolic value to the actors (Greenberg et al., 1995).

Recall that both seating alternatives in Example Presentation 1 offered the prospect of being seated next to some of the other discussants. Thus, choosing between the two alternatives primarily involved a decision between a seating position that required participants to defend their own worldviews versus a seating position that required participants to attack their own worldviews. Across the experimental conditions, a majority of the participants (74%) indicated a preference for the seating alternative that allowed them to defend their own worldviews. Inspection of the frequencies of participant's decisions indicated that the preference for the worldview congruent seating alternative was somewhat more pronounced in the high mortality salience condition relative to the low mortality salience condition (83% versus 66%, respectively). However, a 2 (mortality salience: high vs. low) \times 2 (seating alternative: worldview congruent vs. worldview incongruent) logistic regression analysis failed to show a significant mortality salience by seating alternative effect, $\chi^2(1, N = 58) = 2.28, p < .15$. Possibly, this nonsignificant result was due to a ceiling effect, given that most participants in the low mortality salience condition already showed a preference for the worldview congruent alternative.

Recall that Sample Arrangement 2 consisted of a choice between a seating position that offered the opportunity for both worldview validation and affiliation versus a seating position that offered the opportunity for neither worldview validation or affiliation. Across both experimental conditions, a majority of the participants (79%) indicated a preference for the seating alternative which required them to sit in the group and defend their own worldviews. Inspection of the frequencies of participants' decisions indicated that the preference for the worldview congruent seating alternative was about equal in the high mortality salience condition relative to the low mortality salience condition (83% versus 76%, respectively). A 2 (mortality salience: high vs. low) x 2 (decision alternative: worldview congruent vs. worldview incongruent) logistic regression analysis failed to show a significant mortality salience by decision alternative effect, $\chi^2(1, N = 58) = .42, p < .52$. As before, this nonsignificant result could well have been due to a ceiling effect, given that most participants in the low mortality salience condition already showed a preference for the worldview congruent/sitting in the group alternative.

Actual Seating Decisions. In making their actual, binding seating decisions, participants had to choose between 1) sitting alone and defending an opinion in line with their own worldviews, or 2) sitting in the group and defending an opinion that was at odds with their own worldviews. We subjected participants' decisions to a 2 (mortality salience: high vs. low) x 2 (seating alternative: worldview incongruent/group chair vs. worldview congruent/single chair) logistic regression analysis. As shown in Table 5, this analysis showed a significant interaction effect between mortality salience and seating alternative, $\chi^2(1, N =$

58) = 4.52, $p < .04$. Specifically, preference for the worldview congruent/single chair was found to be weaker under high versus low mortality salience (48% versus 76%, respectively).

Table 5

Seating preference as a function of mortality salience (Study 2.3).

Mortality salience	Preferred seat	
	Worldview congruent/ single chair	Worldview incongruent/ group chair
Low	$N = 22$ (76%)	$N = 7$ (24%)
High	$N = 14$ (48%)	$N = 15$ (52%)

Note. $N = 58$.

Another way of describing the results is to examine the number of individuals who shifted their opinions between the non-binding seating decision in Sample Arrangement 2 (which involved no conflict between affiliation and worldview validation) and the actual, binding seating decision (which did involve a conflict between affiliation and worldview validation). As might be expected, the only shifts that were observed occurred from the worldview congruent seating alternative to the worldview incongruent seating alternative.

Accordingly, we subjected participants' shift intentions to a 2 (mortality salience: high vs. low) x 2 (options: shifters vs. non-shifters) logistic regression analysis. This analysis revealed that heightened mortality salience caused more participants to shift from the worldview congruent seat towards the worldview incongruent seat, $\chi^2(1, N = 58) = 5.88, p = .015$ (54% versus 19 %, respectively).

Discussion

In Study 2.3, we followed a somewhat different methodological strategy in studying the interplay between affiliation and worldview validation defenses. In our previous two Studies, our approach had been rather subtle, by focusing on participants' spontaneous tendencies to affiliate with proximal social groups. By contrast, the approach of Study 2.3 was much more blatant. Indeed, we explicitly presented participants with the dilemma of choosing between sitting alone and defending own worldviews or sitting in the group and attacking own worldviews. In spite of this difference in approach, the findings of Study 2.3 were highly consistent with our previous observations. More specifically, Study 2.3 found once more that mortality salience caused a greater preference for sitting in the group, even when sitting in the group, required participants to attack their own worldviews. It thus appears that mortality salience aroused such strong concerns with affiliation that our participants, at least in the experimental context, were willing to explicitly turn against their own worldviews in order to remain affiliated with the group.

As in the previous three Studies, there is reason to believe that the results of Study 2.3 were not due to a simple lack of involvement among our participants with their own worldviews. First, similar to Study 2.2, the procedures were focused on participants' personal

worldviews, thereby ensuring the personal relevance of these worldviews. Second, the analysis of participants' non-binding seating decisions revealed that participants strongly preferred to defend their own worldviews, provided that doing so did not interfere with their affiliation defenses. Third, the non-binding seating decisions presumably served to prime participants' own worldviews, thereby rendering these worldviews highly accessible (cf. Greenberg et al., 1992). In spite of this, heightened mortality salience caused a greater number of participants to shift towards a world-incongruent seating position that allowed them to remain affiliated with the group. Taken together, the results of Study 2.3 suggest that affiliation defenses are indeed capable of overriding worldview validation defenses, even when the worldviews in question are personally relevant and highly accessible.

Attentive readers may have noticed that in Study 2.3, 52% chose to sit in the group chair, whereas in Studies 2.1 and 2.2, the percentages were 70 and 79%, respectively. It thus appears that the rate of sitting in the group was somewhat lower in Study 2.3 as compared with the other two seating Studies. Conceivably, this difference was due to participants' reluctance to attack their own worldviews, which was explicitly stated as a consequence of choosing to sit in the group in Study 2.3. On the other hand, there were a number of procedural differences between Study 2.3 and Study 2.1-2.2. For instance, the decision to sit in the group was much more explicit in Study 2.3. Assuming that affiliation defenses are highly automatic and even to a large extent sub-cognitive, participants' explicit seating decisions might have been less sensitive to the operation of affiliation defenses. A second procedural difference was that participants in Study 2.3 had been asked to state their seating preferences during a few practice decisions that were nonbinding. Almost all participants preferred the seating option that allowed them to defend their own worldviews, which was not

especially surprising, given that these decisions involved no conflict between worldview validation and affiliation. Although a substantial number of participants shifted between these practice decisions and their actual seating decisions, these practice decisions might have created a motivation among our participants to be consistent between in their decision making, and thus, to choose for the seat that allowed participants to defend their own worldviews. In light of these various procedural differences between Study 2.3 and Study 2.1-2.1, more research is needed to explain why a lower percentage of participants chose to sit within the group in Study 2.3.

General Discussion

The present research highlights the importance of affiliation defenses in the psychological confrontation with death. Across three different Studies, we found that mortality salience led to increased affiliation strivings, as indicated by a greater behavioral tendency to sit next to fellow group members (Study 2.1-2.1), and a more pronounced preference for sitting within the group as opposed to sitting alone (Study 2.1-2.3). The tendency to affiliate with other group members thus emerged as a highly robust reaction towards death-related thoughts. Importantly, mortality salience even led to increased affiliation when group members had previously threatened participants' worldviews (Study 2.1-2.1), or when affiliation with the group forced participants to attack their own worldviews (Study 2.3). As such, it appears that affiliation defenses were powerful enough to override at least some of participants' concerns with worldview validation. Because of the theoretical

importance of the interplay between affiliation and worldview validation defenses, we will consider this issue more closely in the next few paragraphs.

The Interplay between Affiliation and Worldview Validation Defenses

In the present research, we followed a two-fold strategy in addressing the interplay between affiliation and worldview validation defenses. First, we manipulated the extent to which group affiliation was threatening to participants' worldviews, and observed how this affected participants' tendency to affiliate with the group. Because this strategy allows for an examination of affiliation and worldview validation defenses on a single dependent variable, this seems the most direct way to examine the interplay of both defense mechanisms. Remarkably, the results showed that the increase in affiliation due to mortality salience was not moderated by the degree to which affiliation with the group was at odds with participants' worldviews. This lack of moderation effects did not appear to be due the weakness of our manipulations of worldview threat, because we used either worldviews that were central to the culture of our participants (Study 2.1), or worldviews that were ideographically relevant to our participants individually (Studies 2.2-2.3). Moreover, our procedures rendered participants' worldviews highly accessible throughout all three Studies. Attesting further to the strength of our worldview manipulations, some of our other findings clearly showed that our participants were prepared to defend their worldviews, although not in an unqualified manner. For instance, participants displayed a pro-worldview bias on our essay measure in Studies 2.1 and 2.2. In a similar vein, participants preferred to defend their own worldviews in Study 2.3 in their non-binding seating decisions. Thus, our participants seemed both willing

and able to defend their worldviews, just as long as doing so did not interfere with their affiliation strivings.

Our second strategy for examining the interplay between affiliation and worldview validation defenses consisted of administering conventional essay measures of worldview validation (Greenberg et al., 1990) after participants had been provided with an opportunity for affiliation. To control for the earlier operation of affiliation defenses, our analyses of the essay measures took participants prior affiliation status (i.e., their self-chosen seating position) into account. Overall, this strategy is inferentially weaker than the first strategy, because it allows for less experimental control over the extent to which participants had already buffered themselves by affiliating with the group. Still, the second strategy might provide some additional insight into the interplay between affiliation and worldview validation defenses. Study 2.1 did find increased worldview validation under heightened mortality salience, but only among participants who had not affiliated with the group (i.e., those who had chosen to sit down alone). Finally, the essay measure in Study 2.2 again showed increased worldview validation under heightened mortality salience, but this time the effect was unqualified by participants' affiliation status.

Taken together, our findings revealed two broad patterns in the interplay between affiliation and worldview validation defenses. First, affiliation defenses seem capable of overriding worldview validation defenses, especially when the dependent measure directly assesses affiliation behavior. Indeed, across all three Studies, two different measures of affiliation behavior (i.e., behavioral seating position, and self-stated seating preference) revealed evidence for increased affiliation under high mortality salience, regardless of

whether affiliation supported participants' own worldviews or not. By contrast, the essay measures of worldview validation appeared to be somewhat less affected by affiliation defenses, especially in Study 2.1. Conceivably, the essay measures were less sensitive to the emergence of affiliation defenses, given that these measures were less direct and more laden with symbolic meanings than our affiliation measures.

With regard to the latter findings, there was an interesting discrepancy between the findings in Studies 2.1 and 2.2. In Study 2.1, where the essay measure was concerned with culturally valued worldviews, worldview validation defenses were moderated by participants' affiliation status. By contrast, in Study 2.2, the essay measure was concerned with participants' ideographically relevant worldviews, and worldview validation defenses were not moderated by participants' affiliation status. Accordingly, affiliation defenses might be able to override or compensate for worldview validation defenses when the worldviews in question are valued by the culture at large. When such culturally valued worldviews are under attack, people might be able to trivialize or downplay the importance of these worldviews (cf. Simon, Greenberg, & Brehm, 1995). By contrast, when the group threatens personally relevant worldviews, people might be less able to disregard the worldview threat, given that they are already personally invested in these worldviews. Because 2.1 and 2.2 differed on several dimensions besides the personal relevance of the worldviews that were threatened, it is possible that other factors accounted for our results. As such, more systematic research is needed to test whether personal relevance indeed moderates the extent to which affiliation defenses are able to compensate for or override worldview validation defenses.

The Case for Multiple Terror Management Defenses

Even though our empirical analysis of the interplay between affiliation and worldview validation defenses is only preliminary, we would still like to offer some speculations about the broader theoretical implications of our findings. In a recent paper, Pyszczynski et al. (1999) distinguished between two distinct terror management mechanisms. The first type of mechanism consists of largely conscious, pseudo-logical denials of one's vulnerability and the relevance of death concerns (e.g., "I am still young and healthy, it will take a while before I die"). The second type of mechanism is largely unconscious and consists of the defense of broader symbolic meaning structures, such as cultural worldviews, that on the surface bear no logical or rational relationship to the problem of death, but are only distally related to death transcendence.

How do affiliation defenses fit into this conceptual scheme? We may begin by noting that affiliation does not represent a (pseudo-) rational way of denying of one's own mortality. Moreover, none of our participants reported during the debriefing that they had consciously attempted to affiliate with their group to escape from their existential concerns. Thus, affiliation defenses are similar to TMT's conceptualization of distal defense, in the sense of being mediated by implicit, irrational processes. Nevertheless, our findings also indicate that affiliation defenses do not necessarily operate in the service of upholding cultural-symbolic meanings, and may even override the need to defend such meanings. As such, affiliation defenses only partially fit with TMT's notion of distal defenses (Pyszczynski et al., 1999). Instead, the anxiety-buffering role of affiliation may operate to a large extent through sub-

cognitive mechanisms that are independent of socially shared symbolic meanings. Consistent with this, recent psychobiological work (e.g., Carter et al., 1997; Taylor et al., 2000; Uchino et al., 1996) suggests that affiliation is capable of reducing anxiety through neuroendocrine processes. Affiliation defenses are thus qualitatively different from both rational and distal defenses, as a form of defense that relies largely on innate, hard-wired defense systems that operate in humans as well as other animal species.

The current distinction between symbolic and pre-symbolic defenses is much in line with Personality Systems Interactions (PSI) theory, an integrative personality theory that has recently been formulated by Kuhl (2001). PSI theory distinguishes between two forms of implicit functioning, extension memory and intuitive behavior control. Extension memory is a cognitive system that consists of extended networks of self-representations and meaning structures. As such, the functional profile of extension memory makes it likely that this system mediates worldview validation defenses of the kind that are proposed by TMT (Pyszczynski et al., 1999). By contrast, intuitive behavior control is a cognitive system that mediates automatic, often innately prepared forms of self-regulation. As such, the functional profile of intuitive behavior control fits with the highly automatic, sub-cognitive ways in which affiliation defenses appear to operate. According to PSI theory, the distinction between extension memory and intuitive behavior control has a number of profound functional implications. For instance, the activation of extension memory is somewhat slower than that of intuitive behavior control (even though both systems are implicit and automatic), because the activation of extended cognitive networks is likely to be more time-consuming than the activation of simple behavior programs. In addition, extension memory is more likely to vary between individuals, because extension memory develops largely from experience, whereas

large parts of intuitive behavior control are innate. Applied to the current context, we might speculate that worldview validation defenses are probably somewhat slower to emerge, and more prone to individual differences, compared to affiliation defenses. Although the testing of these hypotheses awaits future research, this type of theorizing seems likely to add significantly to our understanding of terror management defenses.

Although we have hitherto stressed the distinction between worldview validation and affiliation defenses, we by no means want to argue that the two kinds of defenses never cooperate. Theoretically, Kuhl (2001) has argued that extension memory and intuitive behavior control (i.e., the cognitive systems that may underlie worldview validation and affiliation defenses), are functionally compatible and often highly interconnected. In line with this, most cultures stress the importance of interpersonal relationships, such as friendship and romantic love (Baumeister & Leary, 1995; Taubmann Ben-Ari et al., 2000; Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000). Moreover, from a developmental perspective, symbolic defenses may evolve from relatively primitive associations between valued behavior and safety and protection that are provided by the primary caregivers (Pyszczynski et al., 1999). As the child's cognitive capacities continue to develop, symbolic defenses may gradually acquire a functional independence from the protection that is offered by the primary caregivers. For instance, the comfort that is derived from father's physical presence might be complemented by the comfort of having a more abstract father figure that resides in heaven and watches over for you when you are alone. Although this account of the interrelationship between worldview validation and affiliation defenses is admittedly crude and speculative, it seems clear that both types of defenses are not only distinct, but also mutually related.

Limitations and Future Perspectives

Before closing, we wish to mention some limitations of the current research, as well as some challenges for future research. First, we want to emphasize that the present studies were explicitly aimed at separating the anxiety-buffering influence of sub-cognitive affiliation behaviors from the anxiety-buffering influence from intrinsically symbolic behaviors such as worldview validation. Although we believe that the distinction between these two defenses is useful on a theoretical level, it is probably most common for affiliation and worldview validation defenses to operate in tandem. In real life situations, people's closest ingroup members are likely to share their attitudes, ideologies, and religious beliefs. Consequently, affiliation and worldview validation defenses probably work together most of the time to shield people's minds from existential concerns. Even so, people may sometimes be confronted with the pressing dilemma of choosing between their personal beliefs and affiliation with the group. For instance, dissidents of all persuasions and nationalities have faced the decision between remaining safe within the silent majority or standing up for their beliefs and facing the potential wrath of the authorities. Closer to home, dissenting communicators often feel pressured to shift their attitudes towards the position of the audience (Lerner & Tetlock, 1999), and individuals holding egalitarian beliefs are made to feel like narrow-minded prudes when they speak out against a sexist joke (Ford, 2000). Studying the range of situations in which affiliation and worldview validation defenses may be in conflict or mutually reinforce each other seems an important agenda for future research.

Second, the present research studied affiliation as a unitary form of defense. Although this strategy was convenient for the present purposes, it might be possible to analyze affiliation defenses into further component processes. For instance, it might be possible to distinguish approach- and avoidance oriented affiliation defenses. Approach affiliation defenses may be directed towards obtaining the positive social outcomes that are associated with being part of the group, whereas avoidance affiliation defenses may be focused on avoiding the negative social outcomes that are associated with being alone (Frank & Brandstaetter, 2002; see also Higgins, 1998). The present paradigm did not allow us to discriminate between approach- and avoidance-oriented affiliation defenses, but recent research in our laboratory suggests that it may be useful to make this distinction (Wisman & Koole, 2001). Third, present Studies only compared mortality salience conditions to neutral control conditions. As such, it remains possible that the observed affiliation defenses qualifies are not unique to terror management processes. Indeed, past affiliation research suggests that this form of defensive occurs under a wide variety of anxiety-provoking events (Schachter, 1959; Taylor et al., 2000). As such, it may well be that affiliation defenses are triggered by a wider variety of threats than worldview validation defenses, which have been shown to occur predominantly in response to death-related threats (Greenberg et al., 1997). Examining the specificity of the present findings to terror management processes thus constitutes an important issue for future research.

Concluding Remarks

The psychological confrontation with death is undoubtedly one of the most terrifying problems that each individual must face. Because of the sheer magnitude of this problem, people need to rely on psychological defenses to shield themselves from existential anxiety. In the present research, we have shown that affiliation with other group members qualifies as an especially powerful terror management defense. When people are reminded of their existential concerns, it suddenly becomes especially important to them to be close to other group members. Notably, this affiliation defense even emerges when other group members threaten one's own worldviews. When plagued by existential concerns, people simply want to hide in the crowd, no matter what ideas this crowd has espoused.

Footnotes

1. Repeating all the analyses in the present research with gender as a covariate did not alter any of the results. This may be due to the small number of male participants, or due to the rather robust affiliation effects after mortality salience that occurred for both male and female participants. Thus, although past research has suggested that gender may moderate affiliation defenses concerns (Taylor et al., 2000; Arndt, Greenberg, & Cook, 2002), the potentially moderating role of gender was not confirmed in the present research.
2. In all three Studies reported in this article, the pattern of findings remained essentially unchanged when participants that were excluded on the basis of procedural errors or misunderstandings were included in the analyses.
3. When seating position was included as a factor in the ANOVA, this analysis yielded a mortality salience by group values interaction, $F(1, 76) = 5.19, p \leq .0151, d = .086$. Thus, the statistical reliability of our findings only became stronger when seating position was taken into account.

CHAPTER 3

From the Grave to the Cradle: Evidence that Mortality Salience Engenders a Desire for Offspring[‡]

September the 11th shook the foundations of liberty and democracy in the United States of America. Nevertheless, this dramatic episode in American history did not destroy the American spirit. On the contrary, the event made the American people conscious of the pride they take in their country and its democratic history (Pyszczynski, Solomon, & Greenberg, 2003). The streets of New York were flooded with an atmosphere of patriotism, mourning, and togetherness shortly after the attack. In the wake of the 11th of September another unusual observation was reported: the marriage rate increased and hospitals all over the country expected a baby boom (CNN, May 2002). Experiencing a terrorist attack and a potential baby boom may appear paradoxical, but is there a link between experiencing such terrifying disasters and the desire to have offspring?

The observation of a link between ‘disasters’ and a baby boom is in itself not novel (e.g., Cohan & Cole, 2002). There are assumptions in the literature that such events may shape important life-course decisions by either functioning as a wake-up call (Martin, 1999) or by increasing the need for close relationships (Cohan & Cole, 2002; Mikulincer, Florian, & Hirschberger, 2003). Aside from rational and relational reasons to desire children, a desire for offspring might be motivated by emotional and individual desires to leave ‘something’ behind in this world. To the extent this motivation affects reproductive desires, having children may represent a way to deal with the threat of death.

[‡] * This Chapter is based on Wisman, A & Goldenberg, J. L. (2005). From the grave to the cradle: Evidence that mortality Salience engenders a desire for offspring. *Journal of Personality and Social Psychology*, 89, 46-61.

Nevertheless, the literature offers no conclusive theoretical framework to explain this often observed correlational connection between severe threats and an apparent striving for offspring.

In this article, a novel theoretical account is advanced for the *causal* relationship between life threatening events and the desire for offspring. According to terror management theory (TMT; Solomon, Greenberg & Pyszczynski, 1991), to cope with existential concerns, people adhere to worldviews that provide a sense of meaning and set the standards through which one can attain a sense of value (i.e., self-esteem). By living up to such standards, individuals obtain a sense of immortality by feeling that one is part of something more meaningful and longer lasting than one's own existence (Greenberg et al., 1990; Solomon, Greenberg & Pyszczynski, 1991). From this perspective, procreation can be regarded as a potential means to regulate concerns about mortality. After all, having children provides a sense of meaning and value (Baumeister, 1991) and can provide an avenue to immortality. Therefore, a relevant hypothesis that surprisingly has not yet been addressed is whether mortality concerns promote a desire for offspring?

However, having children may also pose costs that may interfere with defenses against mortality concerns outlined by terror management theory. In particular, women tend to have greater responsibilities in caring for offspring, and the burden of this responsibility can pose a direct threat to women's ability to derive meaning and value through the also culturally-valued role of being a successful career woman. Thus in this research we address the important question of whether mortality salience influences the desire for offspring differentially for males and females? To examine these issues four experimental studies are reported that investigate the key hypotheses of this theoretical framework.

Terror Management Theory

The ends of life are marked by birth and death. The laws of nature are straightforward; once we are born there is no turning back. Although the future may seem unpredictable, the final episode of our physical life is not; that is, in the end the end is the end. As soon as we are cognitively capable we start to ponder death, and seek strategies to manage the concerns about mortality (Florian & Mikulincer, 1998). Terror arises from the juxtaposition of a biological creature programmed for survival with the ability to reflect on its vulnerabilities and mortality (Becker, 1973). Ernest Becker (1973) argued that this paradox of the human condition is at the core of human motivation. Based on the writings of existential thinkers like Kierkegaard, Rank, and Becker, terror management theory provides a systematic analysis of how one's fear of death (terror) is 'managed' (Solomon, Greenberg, & Pyszczynski, 1991; Greenberg et al., 1997; Pyszczynski, Greenberg, & Solomon, 1999).

Terror management theory postulates that human beings use the same cognitive capabilities that render them aware of the problem of mortality in the first place to develop means of managing the problem. Specifically, the management of terror is posited to occur via a symbolic system of defense in which culturally constructed views of the world provide protection by offering a sense of meaning and, importantly, a promise of symbolic immortality to individuals who uphold cultural standards (Greenberg et al., 1997). That is, by living up to meaning-conferring cultural standards people can feel as if they are part of something significant and lasting. People who subscribe to religious worldviews are even promised literal immortality, to the extent that they believe that living up to religious

standards guarantees them entry into some kind of afterlife. Thus, reminders of mortality operate on an unconscious level to activate this ‘psychological immune system’ and increase the need to adhere to meaningful conceptions of the world and to feel as if one is attaining one’s culture’s standards (i.e., self-esteem). Thus, in a sense, terror management theory elucidates why most people are not paralyzed with terror.

In support, research on TMT has demonstrated that reminders of one’s mortality increase cognitive and behavioral efforts to maintain or defend the anxiety buffering structure by embracing one’s cultural worldview and its standards of value. For instance, reminders of one’s own death (i.e., mortality salience) have been found to lead to increased preference for those who praise or share one’s beliefs (Greenberg, et al., 1990; Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992), harsher judgments against those who violate one’s moral principles (e.g., Florian & Mikulincer, 1997; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989), increased rejection and avoidance of out-group members (e.g., Greenberg et al., 1990; Ochsman & Mathy, 1994), and increased identification with a successful ingroup and decreased identification with a unsuccessful ingroup (Dechesne, Jansen, & van Knippenberg, 2000; Arndt, Greenberg, Schimel, Pyszczynski, & Solomon, 2002). Further, people try more fervently to measure up to personally relevant cultural standards when primed with mortality salience (e.g., Goldenberg, Arndt, Hart, & Brown, in press; Taubman Ben-Ari, Florian, & Mikulincer, 1999); and, in fact, such attempts to boost one’s self-esteem are often pursued even when to do so could pose a direct threat to one’s life (e.g., driving fast; Taubman et al., 1999). By and large, these studies have shown that cultural worldviews and self-esteem function as a psychological defense against existential concerns (for a broad review see Greenberg et al., 1997); and moreover, the nature of defense against

mortality concerns are not direct remedies for the problem of death, but rather, indirect solutions that operate on a psychological level.

Importantly, the described effects are found in response, not to conscious contemplations of mortality, but to recently activated concerns about mortality that are no longer consciously accessible. It is when mortality concerns are unconscious that they activate symbolic defenses pertinent to the individual's bases of meaning and value (e.g., Arndt, Greenberg, Pyszczynski, & Solomon, 1997). Indeed, in most TMT research, symbolic defenses are assessed when an explicit contemplation of one's mortality is followed by an intervening delay (e.g., Greenberg et al., 1994), or alternatively, unconscious mortality concerns can be activated via subliminal death primes (e.g., Arndt et al., 1997). In short, terror management theory uniquely specifies the nature of psychological symbolic defenses against mortality concerns, showing specifically that people do not cope with unconscious mortality concerns with defenses that are rationally connected to the problem of death, but rather they do so through a symbolic solution that offers a sense of meaning and promise of symbolic immortality.

Giving Birth to Immortality

Although the previous research illustrates that mortality salience exerts influence on a wide range of attitudes and behaviors, no studies have directly addressed the role of mortality reminders on people's desire for offspring. This is surprising since giving birth to a child seems to coincide with all the mechanisms that terror management theorists have suggested function to assuage mortality concerns. Having children can contribute to a sense of

immortality, in both a literal and symbolic sense, and can help fortify a sense of meaning and self-worth. It seems reasonable then to conclude that having children may function as part of the psychological defense against existential concerns outlined by terror management theory.

At the most basic level, it makes sense that offspring can function as a defense against mortality concerns, for having children seems to be the most direct way of attaining, in a sense literal, immortality. As Ernest Becker (1973, p.163) suggested, “*Nature conquers death not by creating eternal organisms but by making it possible for ephemeral ones to procreate.*” In a literal sense, offspring entail passing on about 50% of ‘the ephemeral ones’ genes into a new generation. Indeed, a central tenet derived from evolutionary biology is that individual organisms behave as to maximize their fitness by propagating as many as possible of their own and related genes (Wilson, 1975; Dawkins, 1976; Hamilton, 1964; Dawkins, 1982). Supporting this idea of inclusive fitness, people are clearly more likely to invest in their own offspring. For example, Daly and Wilson (1988) reported that incidences of non-lethal child abuse and homicide correlate highly with non-biological fatherhood and Littlefield and Rushton (1986) revealed that the amount of bereavement is correlated with genetic relatedness. These findings demonstrate that biological hard-wired motives, such as inclusive fitness, may influence people’s attitude towards offspring (see Belsky, Steinberg, & Draper, 1991; Buss, & Kenrick, 1998).

Although the premise that the desire for offspring is an evolved mechanism is intuitively appealing, evolutionary psychologists typically do not talk about evolution as fostering *conscious desire* to pass on one’s genes, and specifically, it has been considered unlikely that humans evolved with a specific module for a desire for offspring (Veenhoven, 1975). The question of whether the desire for offspring is an evolved mechanism is

complicated and is not the primary focus of this paper (although we do address this possibility more comprehensively in the Discussion). However, this question pending certainly does not preclude the possibility that in human beings motivations informed by perspectives other than evolutionary psychology – such as the desire for literal immortality as a means to warding off fears of death (see Dechesne et al., 2003) – can promote a desire for offspring.

However, as terror management and others researchers (e.g., Sedikides & Skowronski, 2003) have illustrated, in human beings the self is conceptualized in an abstract symbolic manner. As delineated above, individuals cope with concerns about mortality not simply by striving for literal immortality, but in human beings immortality striving often takes a symbolic form. Indeed, empirical research has provided evidence for the hypothesis that immortality strivings can function to assuage mortality concerns (Dechesne et al., 2003; Greenberg, Solomon, & Pyszczynski, 1997; Norenzayan, Hansen, & Atran, 2003; Ochsmann, 1984; Osarchuk & Tatz, 1973). Confronted with existential concerns people seek ways to achieve immortality (Norenzayan et al., 2003), and having children may be one of the most efficient ways to prolong a form of symbolic existence. Thus, apart from providing a direct form of literal immortality, having offspring can contribute to a sense of symbolic immortality (Lifton, 1980; see also, Florian & Mikulincer, 1998; Greenberg, Solomon, & Pyszczynski, 1997). That is, children can represent for parents a means of leaving ‘something’ behind in this world after their own literal demise. For example, one can simply hope to be remembered as a loving and caring parent, or more ambitiously, view one’s children as inheritor of one’s ideology or business. These kinds of immortality strivings are highly intertwined with cultural worldviews (Lifton, 1968). For instance, in one culture a parent may hope to be remembered

as a brave warrior while in another culture one may hope to be remembered as an understanding open-minded parent. Thus, people can strive for some means of symbolic self-continuation through their offspring (Kinlaw, Archuk & Dixon, 1980) within the context of a cultural meaningful universe.

But not only can one's offspring confer symbolic meaning to the parent in the hereafter, but in the here and now, having children can provide a large degree of meaning and value to the life of the parent. Indeed, certainly in Western culture, people expect their children to supply an important source of meaning in life (for a broad overview, Baumeister, 1991; Callan, & Hennessey, 1989). People who suffer from infertility, for instance, often go through long periods of feelings of meaninglessness (Callan, 1987; Callan & Hennessey, 1989). By the same token, childless people are perceived by others to lack fulfillment (e.g. Baumeister, 1990). Moreover, traditional societies have relied on their offspring as a kind of retirement pension, providing some security (food, shelter etc.) in the remains of their days (Zhan & Montgomery, 2003). Closer to home, aged parents often expect filial responsibilities from their children (Hamon & Blieznier, 1990). Although children do not always meet the expectations of parents, research has revealed that loneliness was reduced by affection of their offspring (Valora, Long & Martin, 2000). Moreover, having children might provide a sense of meaning in a more indirect way. Parents may attain a sense of meaning by basking in the glory of their successful children (e.g. Cialdini et al., 1976; Tesser, 1988). Some parents even seem to risk the well-being of their own children in order to 'help' their children achieve at the highest level (from beauty queen to chess champion or whale hunter, depending on the culture). It is likely that parents motivate their children to pursue roles that are highly valued within the context of their cultural worldviews because to do so also reflects positively on

their own self. In a sense, children can become a symbolic extension of the self (e.g., Sedikides & Skowronski, 2003). In sum, it seems that having offspring can represent multiple powerful pathways to meaning and thus a sense of value within the context of an individual's worldview.

For all these reasons, it is not surprising in light of the terror management theory that people desire offspring and that they may be more likely to do so after being reminded of their mortality. First, having children entails a promise of literal and symbolic immortality; and second, people expect that having offspring provides a powerfully source of meaning and self-worth. In sum, there is substantial theoretical evidence suggesting that a desire for offspring functions as part of people's symbolic defense system against existential concerns. Thus, we see these different motivations for having offspring as complementary to one another, to the extent that they are all part of a cultural anxiety buffer, and as such can play a role in the management of existential terror. Consequently, based on the terror management theory, the prediction can be made that a reminder of mortality promotes a striving for procreation. Thus, although the ends of life are marked by birth and death, the recognition of death may be the cradle of new life.

A Gender Engendering Perspective on a Desire for Offspring

In the current series of studies we demonstrate support for the hypothesis that the desire for offspring can function as a terror management defense by making specific predictions as to for whom and under what conditions mortality salience would be expected to influence this desire. In particular, we suggest that while men would be expected to increase their desired

offspring after contemplating their death, women's reactions may be more complex. Of course for women childbirth is complicated by the fact that women and men carry different responsibilities with respect to having children. Among mammals, the physical consequences of maternity for females (such as pain, bodily changes, and health risks) outweigh the costs for males (Trivers, 1985; Buss, 1996; Buss, & Kenrick, 1998). However, while we believe that such differences between the sexes certainly contribute to male's and female's attitudes and behaviors with regard to procreation, following other research on terror management theory, reminders of one's mortality should promote a need to manage mortality concerns through symbolic defenses, and thus for women having offspring, while offering a pathway to meaning as well as immortality, also poses a threat to meaning and value derived via other culturally prescribed roles.

Although nowadays women participate in cultural practices (such as politics, arts, and science) that have been traditionally dominated by men (Mason & Lu, 1988; Thornton, 1989; Wilkie, 1993), when it comes to family roles, gender differences are still profuse (Cassidy & Warren, 1996). For instance, in response to increased career opportunities for women, women more often than not have to juggle the responsibilities of their new role as a career-woman and their more traditional responsibilities of wife and mother (Kiecolt, 2003; Spitze, 1988). In contrast, men more rarely combine having a career with a significant care-taking role in the family (Biernat, & Wortman, 1991). Indeed research has shown that the 'double role' of both worker and primary care-provider causes overstrain among women (Wortman, Biernat & Lang, 1992). This may lead women to be more conflicted than are men about their performance in home roles, especially among married couples with young children and relatively equal status careers (Biernat, & Wortman, 1991).

It seems reasonable, therefore, to speculate that women who emphasize the cultural value of a career anticipate a conflict when thinking about having children. If our position is valid, this would be especially likely among women with high career strivings after a mortality salience induction. To be clear, this is not to say that women do not desire offspring as much or even more than men, or even that women's desire for offspring may not be enhanced by mortality salience in the same way it is for men. However, if another salient need contradicts the desire for offspring, then mortality salience may not lead to an increase in the desire for offspring among women. These predictions are in line with other research demonstrating that people's symbolic defenses against existential concerns are flexible in the face of multiple anxiety buffers (Dechesne et al., 2003; Wisman & Koole, 2003). For instance, it has been found that participants who supported two sport teams in different sport disciplines (baseball and football) identified strongest with the most successful sport team after mortality salience (Dechesne, Greenberg, Arndt & Schimel, 2000). More to the extreme of 'flexible' defenses, Wisman and Koole (2003) found that participants who were reminded of their own mortality expressed a relative preference to hide in a crowd of different minded people over defending their own worldview in an isolated position. This kind of research is compatible with the multifaceted self-regulation concept and terror management theory, which suggests that defenses against mortality concerns are 'used' in a rather flexible manner (Dechesne et al., 2003; Steele, 1988; Tesser, Martin, & Cornell, 1996; Tesser, Martin, & Cornell, & Beach, 2000; Wisman & Koole, 2003).

The Present Research and Hypotheses

If we apply this dynamic model of defense to the question of how to predict both genders' desire for offspring after mortality salience we can generate the following hypotheses. Among women who foresee a successful career, such as students, a reminder of death might promote career strivings that at the same time impede a desire for offspring due to the aforementioned ambivalence of combining a career with having children (Mckinney, 1987). Indeed, pilot data (see Study 3.4) revealed that the majority of the female participants view having children as a threat to career opportunity and women perceive their careers as more threatened by having children than do men. Thus, self-relevant views (i.e., career strivings) potentially conflict with a desire for offspring and thus may result in a decreased desire for offspring after mortality salience. However, if the conflicting aspects of the self-relevant worldview are reduced (e.g., if a career is less relevant or children are perceived as compatible with one's career), the desire to have offspring should offer a viable psychological defense against mortality concerns and women are consequently expected to have a relatively stronger desire for offspring after mortality salience. In contrast, both children and a career are usually perfectly compatible for men (because the care-giving tasks that might impede career advancement are mostly done by women or are not realistically anticipated by men, Biernat, & Wortman, 1991), thus men are expected to show an increased desire for offspring after a reminder of death regardless of career ambitions.

Thus, terror management theory allows us to make specific causal predictions as to for whom and under what conditions mortality salience would increase the desire for offspring, however, it is also important to acknowledge that there are other motivations that may be rooted in a need to manage terror that may be related to, but distinct from, a desire for

offspring as a defense against mortality concerns. For example, Mikulincer, Florian, and Hirschberger (2003) recently argued and provided evidence for the proposition that close-relationships can function as a shield against mortality concerns. Drawing on this, it can be hypothesized that mortality salience may promote people's desire for offspring as a byproduct of close-relationship strivings (Cohan & Cole, 2002). Indeed people often consider having children as an act of love and a seal of a happy relationship (Ingraham, 1999). However, we suggest that people's desire for offspring is, at most, partially motivated by relationship strivings. For people sometimes desire having children without the desire, or permission, of their partner and people can long for offspring without having any close relationship at all. Although we certainly believe that close relationships strivings are 'attached' to strivings for offspring, we suggest that close relationship strivings are only part of the story and thus will not account for our findings.

Another related, but we believe distinct, motivation is the desire for sex. There is an obvious connection between sex and offspring – one that we assume does not need to be spelled out. However, as with close relationships, we suggest the desire for offspring, independent of sexual desire, can function as a buffer against existential concerns. Certainly people can attain offspring without sex, either through adoption or a growing repertoire of fertility treatments, such as artificial insemination. Further, in a series of experiments, Goldenberg and her colleagues (e.g., Goldenberg et al., 1999; Goldenberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002) showed that mortality concerns often lead individuals to express decreased rather than increased interest in the physical aspects of sex. Thus, as with

close relationships, we suggest that any influence of mortality salience on the desire for offspring cannot be wholly attributed to a desire for sex.

Thus, in this series of studies we will manipulate mortality concerns and examine the effect on desired offspring, taking measures to control for close relationship and sexual strivings. Moreover, we also offer precise predictions concerning gender differences in the desire for offspring that we suggest allows us to pit a terror management explanation above and beyond other factors that can also affect the desire for offspring. We hypothesized that mortality salience should promote the desire for offspring among men, but not women, since for women having offspring may conflict with other defenses against mortality concerns. The first two studies were set up to test our basic hypothesis that reminders of death would lead to an increased desire for offspring among male participants but not among female participants. In a third study, we tested whether career ambition would conflict with women's, but not men's, desire for offspring as a function of mortality salience. Finally, in Study 3.4, we directly manipulated female participants' views with respect to the advisability of having children in conjunction with a successful career, and tested whether undoing the source of conflict for women would allow for an increase in the desire for offspring.

Study 3.1

The first study was designed to examine the desire for offspring as a function of mortality salience and gender. To this end, we assessed the number of children desired after a traditional mortality salience prime. Because we were predicting differential effects for males and females, we measured the accessibility of death-related thoughts subsequent to the mortality salience induction in order to show that differential findings could not be attributed

to a greater impact of the mortality salience prime among one gender. In particular, we hypothesized that males would respond to mortality salience with an increase in their desired number of offspring, but females, due to a conflict between maternal responsibilities and career ambitions, would not respond with parallel increases in their desires for offspring.

In addition, we also assessed participants' current relationship status to ascertain whether any increase in desire for offspring could be attributed to a desire to be more intimate in one's close relationships (Mikulincer, Florian, & Hirschberger, 2003). If the desire for procreation is merely associated with a desire for closeness, we would expect people who are involved in a serious relationship to be more likely to increase their desire for offspring to cope with existential concerns.

Method

Participants and Design. Seventy-six undergraduate students from the Free University of Amsterdam (36 woman and 40 men, average age 21) were randomly assigned to either the mortality salience or control condition. Participants received Dfl. 5,- (around 2 US dollars) for their participation.

Procedure and Materials. Upon arrival in the laboratory, participants were welcomed and seated in separate cubicles each containing an Apple Macintosh computer. All instructions and materials were administered via computer in Dutch. The study was described as consisting of a number of separate unrelated parts.

Mortality salience. The first part was described as research on personality and consisted of a few filler questionnaires followed by the mortality salience manipulation.

Mortality salience was manipulated with same two open-ended questions about death or a control topic that has been used in numerous TMT experiment (e.g. Rosenblatt et al., 1989). Specifically, participants were asked: 1) Describe the emotions you feel while you are thinking about your own death; 2) Describe what you think will happen to you when you physically die. Control participants were asked two parallel questions about watching television.

Self-reported affect. The manipulation was followed by the 20-item Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988), which measures affect. The items were presented in random order and scored on a 5-point scale (1 = not at all; 5 = very much). The PANAS also served to provide a delay and distraction task after the manipulation, since previous TMT research has revealed the effects of mortality salience are specific to conditions in which individuals are no longer consciously attending to such thoughts (e.g., Greenberg, Pyszczynski, et al., 1994).

Death accessibility. The PANAS was followed with a short translated version of the measure often implemented to gauge the accessibility of death-related thought (Arndt, Greenberg, Solomon, Pyszczynski, 1997). The scale consisted of 14 word fragments that were presented in random order. Four word fragments could be either completed with a death-related word or a death-unrelated word. For instance, the word fragment “DEA” could be completed as either “DEAL” or “DEAD.” The remaining 10 word-fragments could be completed with only death-unrelated word.

Desire for offspring. We assessed the number of desired offspring with two questions. Participants were asked: “How many children would you like to have in your fantasy?” and “How many children would you like to have in reality?” These two items were scored on a 6-

point scale ranging from 0 = “no children at all” to 6 = “six children.” We found that responses to these items were highly reliable and thus a single desire for offspring composite was created by averaging the two items (Cronbach’s $\alpha = .89$). It was stressed that there were no good or bad responses and that participants should answer the questions in a quick and spontaneous manner.

Relationship status. Among some demographic items, participants’ relationship status was assessed. Relationship status was assessed by one dichotomous yes-no item: “Are you currently involved in a romantic relationship?”

As a manipulation check, participants were asked about the purpose of the experiment (to which all participants were naive). Participants were subsequently debriefed and dismissed.

Results

Self-reported affect. A 2 (mortality salience: death vs. control) x 2 (gender: male vs. female) between-subjects analyses of variance (ANOVA) was conducted on the two subscales of the PANAS. The analyses did not reveal any significant effects on either the positive or negative affect subscales (both $ps > .15$). This result is consistent with most other TMT research (e.g., Pyszczynski, Solomon, & Greenberg, 2003) finding that the mortality salience manipulation has no effect on self-reported mood.

Death accessibility. The scores on the death accessibility scale were subjected to a 2 (mortality salience: death vs. control) x 2 (gender: male vs. female) between-subjects ANOVA. This analysis yielded a significant main effect showing that participants in the mortality salience condition completed more word fragments into death-related words relative

to the control condition, $F(1, 72) = 4.66, p < .05$. Thus, the manipulation of mortality salience did have the desired effect of making mortality concerns more salient. Importantly, no main or interaction effects for gender were found ($ps > .4$), and thus any discrepancy in the effects for males and females in response to mortality salience cannot be attributed to differential effectiveness of the manipulation.

Table 1

Procreation striving as indicated by the number of desired children as a function of a mortality salience by gender interaction (Study 3.1).

Mortality salience	Gender	
	Females	Males
Control		
<i>M</i>	2.53	2.00
<i>SD</i>	.81	.87
<i>N</i>	18	20
Death		
<i>M</i>	2.30	2.78
<i>SD</i>	1.00	.82
<i>N</i>	18	20

Number of desired children. Desire for offspring was also subject to a 2 (mortality salience: death vs. control) x 2 (gender: male vs. female) between-subjects ANOVA. The result yielded only the predicted mortality salience by gender interaction, $F(1, 72) = 6.11, p < .02$. As shown in Table 1, male participants displayed a wish for more children under mortality salience compared to control salience, $F(1, 74) = 7.94, p = .006$. In contrast, no

difference in desired offspring was found for female participants under mortality salience compared to the control condition ($p > .4$).

Relationship status. All analyses were repeated with relationship as a factor. No significant results were found for relationship ($ps > .3$), nor did including relationship status in the analysis affect the significant findings.

Discussion

The findings of Study 3.1 support our prediction that mortality salience would increase procreation strivings for men but not women. Male participants in the mortality salience condition displayed a wish for more children compared to the neutral condition. Female participants on the other hand were not affected by mortality salience and even showed a non-significant trend in the direction of desiring less offspring under mortality salience.

Importantly, it is not likely that these gender differences can be accounted for by differential effectiveness of the mortality salience manipulation for males and females because this manipulation has been used well over 100 times with no gender differences (see e.g., Greenberg, Pyszczynski, & Solomon, 1997) and because our death accessibility manipulation check revealed that while there was a main effect of the mortality salience manipulation there was no main or interaction effects involving gender. In addition, it is also notable that participants' relationship status did not alter any of the aforementioned findings. Of course, not being in a relationship does not preclude the possibility that one might desire offspring as a proxy for closeness to another; however, the failure to find any effect of

relationship status in conjunction with the finding that mortality salience only increased procreation striving among men renders the alternative explanation that procreation striving can be accounted for by relationship striving extremely unlikely.

One alternative explanation left unexplored is whether the findings are specific to mortality concerns or whether such effects occur after contemplating any negative topic. Although we cannot think of a rationale for why negative thoughts would lead men, and not women, to desire more offspring, we felt that it was critical to replicate these findings when mortality concerns were contrasted to an unpleasant control topic.

Study 3.2

Study 3.2 was therefore designed with two primary goals in mind. First, we sought to replicate the findings of Study 3.1 when mortality salience was contrasted with an aversive rather than a neutral topic. Second, although following the precedent of other terror management research we viewed an increase in desired number of offspring in response to mortality salience to indicate that the desire for offspring was serving a terror management function, we wanted to test this assumption further by examining whether increased interest in offspring would in turn reduce further defensiveness against mortality concerns. If a desire for offspring is indeed part of the psychological anxiety buffer, the activation of desires for offspring should provide protection against mortality salience, and as such, reduce responses on other subsequent measures that aim to tap defensiveness (see McGregor, Simon, Arndt, Greenberg, & Solomon, 1998). Thus, we followed the desire of offspring measure with a worldview defense paradigm modeled after previous terror management research.

Method

Participants and Design. Seventy-six undergraduate students from the Free University of Amsterdam (38 woman and 38 men, average age 21) were randomly assigned to either the mortality salience or non-death-related aversive control condition. Participants received Dfl. 5,- (around 2 US dollars) for their participation.

Procedure and Materials. As in Study 3.1, participants were welcomed and seated in separate cubicles each containing an Apple Macintosh computer on which the instructions and all materials were administered.

Mortality salience. In order to compare to mortality salience to another aversive topic, participants in our control condition were asked to think about a visit to the dentist. Specifically, participants were asked: 1) Describe the emotions you feel while you are thinking about (your own death/a visit to the dentist); 2) Describe what you think will happen to you when you (physically die/visit the dentist).

Self-reported affect. Immediately following the mortality salience treatment, participants rated their current feelings on the PANAS.

Desire for offspring. As in Study 3.1, participants got the instruction to give fast responses in a spontaneous manner, followed by the two same questions about how many children participants desired. As in Study 3.1, these two items were averaged to form a composite measure (Cronbach's alpha = .90).

Worldview defense. In most terror management research (e.g., Greenberg, Pyszczynski, Solomon & Rosenblatt, 1990; Rosenblatt, Greenberg, Pyszczynski & Solomon, 1989) worldview defense has been assessed by participants' judgment of a pro-USA essay

versus an anti-USA essay. However, the Netherlands is known for its tolerant worldviews towards people with different opinions, and moreover, tolerance has been a central tenet within Dutch society (Schama, 1997). Since prior research has shown that mortality salience can promote even more tolerance towards worldview threatening others among those who embraced tolerant worldviews (Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992), the anti-Dutch essay was deemed as not particularly suitable for tapping worldview defense in the Netherlands; consequently, only a Pro-Dutch essay was used as a dependent measure of worldview defense (Wisman & Koole, 2003; see Hart, Shaver, & Goldenberg, in press for other research revealing worldview defense effects only on a worldview supportive essay).

Thus, in the third part of the study, participants were asked to answer some questions regarding a short essay. This essay (Wisman & Koole, 2003) was closely modeled after the pro-USA essay that has been used in previous terror management experiments (e.g., Greenberg et al., 1992). Specifically, this essay was supposedly written by a foreign student staying in the Netherlands and the essay delivered praise to Dutch culture. The pro-Dutch essay read as follows: “The first thing that strikes you right away is the total freedom that people have in this country. There are good opportunities for everyone, and the education system is excellent. You can achieve whatever you want and there is a unique system that protects people with lesser chances. I have to say that I admire Dutch people because of their hospitality and their tolerance. Of course there are some weak points in the Netherlands as well, but in general I think that you should be proud of the fact that so many people from different cultures can live here in harmony. Dutch people should be proud that people in the Netherlands live in a democratic and tolerant country.”

The essay was followed by a questionnaire asking participants to provide evaluations of the author and the essay. Five of these questions were based on the Interpersonal Judgment Scale (IJS; Byrne, 1971) and the two remaining questions were concerned with participants' global evaluations of the essay (see Greenberg et al., 1990). Representative items based on the IJS were "Would you like to meet this person?" and "To what extent do you think this person uses good arguments?" The global evaluation items were, "To what extent does this essay appeal to you?" and "Does this essay affect you in a positive or negative manner?" All questions were scored on 9-point scales (from 1 = not at all, to 9 = very much; or from 1 = very negative, to 9 = very positive).

After participants had evaluated the pro-Dutch essay, demographic information was assessed, and participants were probed for suspicion (all were naive), debriefed, and dismissed.

Results

Self-reported affect. A 2 (mortality salience: death vs. control) \times 2 (gender: male vs. female) between-subjects ANOVA was conducted on the two subscales of the PANAS. These analyses revealed a main effect for mortality salience on negative mood, $F(1, 72) = 4.85, p < .05$. Participants in the mortality salience condition reported more negative feelings than participants in the dental pain condition ($M = 15.71; SD = 5.71$ versus $M = 13.18; SD = 4.09$). This result is inconsistent with most terror management findings in which the mortality salience treatment, contrary to intuition, does not affect self-reported mood. There was, however, no interaction between mortality salience and gender ($p = .7$), and thus it is not likely that negative affect mediates the interaction effects reported below (Baron & Kenny,

1986; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). However, in light of this finding, the analyses below were repeated with the inclusion of negative affect as a covariate; all significant effects remained the same and thus are presented only without the covariate. Analyses with the positive affect sub-scale of the PANAS did not approach significance ($ps > .3$).

Number of desired children. The desire for offspring composite was subjected to a 2 (mortality salience: death vs. control) x 2 (gender: male vs. female) between-subjects ANOVA. The analyses revealed a mortality salience by gender interaction, $F(1, 72) = 4.06, p < .05$.

Table 2

Procreation strivings as indicated by the number of desired children as a function of a mortality salience by gender interaction (Study 3.2).

Mortality salience	Gender	
	Females	Males
Control		
<i>M</i>	2.74	2.13
<i>SD</i>	1.17	1.03
<i>N</i>	19	19
Death		
<i>M</i>	2.37	2.87
<i>SD</i>	1.23	1.33
<i>N</i>	19	19

As shown in Table 2, male participants revealed a strong trend toward desiring more children under the mortality salience compared to the dental pain control condition, $F(1, 74)$

= 3.66, $p = .06$. In contrast, female participants revealed a non-significant trend in the direction of desiring fewer children when mortality was salient, $F(1, 74) = 0.88, p > .3$. Thus, Study 3.2 provides converging support for the findings of Study 3.1 showing that mortality salience led to a somewhat greater desire for procreation among male participants and not among female participants.

Worldview defense. An evaluation of the worldview supportive essay was created by aggregating the items assessing reactions to the pro-Dutch essay. Six out of seven items were found to load on a single factor (loadings $> .6$). These items (excluding “this person seems to be intelligent”) were averaged into a single pro-Dutch composite (Cronbach’s alpha $> .80$). Then the pro-Dutch composite was subjected to a 2 (mortality salience: death vs. control) \times 2 (gender: females vs. males) between-subjects ANOVA.

Table 3

Pro-Netherlands bias as a function of a mortality salience by gender interaction (Study 3.2).

Mortality salience	Gender	
	Females	Males
Control		
<i>M</i>	5.57	6.15
<i>SD</i>	1.65	.93
<i>N</i>	19	19
Death		
<i>M</i>	6.44	5.97
<i>SD</i>	.69	.79
<i>N</i>	19	19

This analyses yielded a gender by mortality salience interaction, $F(1, 72) = 4.39, p < .05$. As Table 3 shows, female participants had a stronger preference for the Pro-Dutch essay in the mortality salience condition compared to control salience condition, $F(1, 36) = 4.45, p < .05$. In contrast, male participants' preference for the Pro-Dutch essay was not affected by the mortality salience manipulation ($p > .5$). That is, worldview defensive reactions were only found among female participants.

Discussion

The results of Study 3.2 provide evidence of a causal effect of a death reminder on the desire for offspring. As expected, relative to dental pain salience, mortality salience led to an increased number of desired children among male participants. In contrast, female participants did not display an increase in procreation strivings after mortality salience. Thus, consistent with the findings of Study 3.1, increased desire for offspring appeared to serve a terror management response only for males. Converging evidence that these procreation strivings functioned as an anxiety buffer against mortality salience was provided by the findings that while female participants exhibited worldview defense after mortality salience, male participants did not. These findings are particularly powerful since the same measurement of worldview defense has been used previously with no specific gender effects regarding worldview defense after mortality salience (Wisman & Koole, 2003), numerous experiments have shown that both women and men can use patriotic worldviews to cope death anxiety (see Greenberg, Solomon, & Pyszczynski, 1997), and because other studies have showed that male participants are even more prone to think about patriotic topics after mortality salience than are females (Arndt et al., 2002). Thus, the finding that, in response to mortality salience,

males increased their desired number offspring but did not respond with increased worldview defense when it was subsequently measured and that females showed no increase in desired offspring but did respond with increased worldview defense provide particularly compelling evidence that for males the desire for offspring can function as a buffer against existential concerns. The findings also provide evidence, consistent with Study 3.1, that women are not unaffected by mortality salience, but rather are merely not defending with a desire for offspring, as are their male counterparts.

Thus the findings of Studies 3.1 and 3.2 provide evidence that the desire for offspring is a more viable worldview defense for men than women. However, these studies do not provide any explanation as to why this would be the case. The remaining two experiments were therefore designed to both replicate the current findings and provide direct evidence for our hypothesis that the conflict between maternal responsibilities and career ambition in women makes the desire for offspring a less viable means of responding to mortality concerns for women than men.

Study 3.3

Study 3.3 was designed to directly test the hypothesis that career ambition would conflict with women's, but not men's, desire for offspring as a function of mortality salience. Therefore, in this study career striving was assessed and we tested whether it moderated the effects of mortality salience on the desire for offspring. We hypothesized that, if children represent a conflict to women's but not men's careers, career striving should moderate the effect of mortality salience for women but not for men. In addition, this study included an

item assessing level of sexual desire in order to confirm that effects of mortality salience by gender on the desire for offspring are attributable to a desire for offspring per se and not to differences in the desire for sex.

Method

Participants and Design One hundred and twenty-seven undergraduate students from the Free University of Amsterdam (71 woman and 56 men, average age 21) were randomly assigned to either the mortality salience or control condition. Participants received Euro 2, - (around 2 US dollars) for their participation.

Procedure and Materials Upon arrival in the laboratory, participants were welcomed and seated in separate cubicles each containing an Apple Macintosh computer on which all instructions and materials were administered.

Career-strivings. The first part was described as research into personality and consisted of a few filler questionnaires and four items that were designed to measure participants' career strivings. Participants were asked to indicate to what extent they agreed with the following statements: 1) "I would never give up my career for my family;" 2) "If I had to choose between a career and having children, I would choose having children;" 3) "My highest priority is to concentrate on my studies to prepare for a career;" 4) "Having a career is relatively unimportant for me." Participants responded on a 9-point scale (1 = totally disagree; 9 = totally agree). The items of the career striving scale loaded sufficiently on one factor (loadings > .6) and, accordingly, the four items were appropriately scored and averaged into a single 'career strivings index (Cronbach's alpha = .67).

Mortality salience. Participants were asked to respond to the same open-ended questions about death or a dental visit used in Study 3.2.

Self-reported affect. Again, the mortality salience manipulation was followed by the PANAS.

Desire for offspring. Then again, participants got the instruction to give fast responses in a spontaneous manner, followed by the two same questions about how many children participants desired (Cronbach's $\alpha = .89$).

Relationship status and sexual desire. Finally, participants filled out a form containing demographic items including relationship status and an additional question asking participants to indicate the extent to which they agreed with the following statement: "I have a salient desire for sex." Participants responded on a 9-point scale (1 = totally disagree; 9 = totally agree).

As a manipulation check, participants were asked about the purpose of the experiment. Participants were then debriefed and dismissed.

Results

Manipulation check. Three participants guessed the purpose of the experiment, and therefore were excluded from the analyses.

Self-reported affect. A 2 (mortality salience: death versus control) x 2 (gender: male vs. female) between-subjects ANOVA was conducted on the two subscales of the PANAS. These analyses did not reveal any significant effects on the subscales of the PANAS ($ps > .2$). The data below were therefore not analyzed with mood as a covariate.

Number of desired children. The desire for offspring composite was subjected to a 2 (mortality salience: death versus control) x 2 (gender: male vs. female) between-subjects

ANOVA. Once again, the result yielded a mortality salience by gender interaction, $F(1,123) = 13.23, p < .001$.

Table 4

Procreation strivings as indicated by the number of desired children as a function of a mortality salience by gender interaction (Study 3.3).

Mortality salience	Gender	
	Females	Males
Control		
<i>M</i>	2.42	1.91
<i>SD</i>	.84	.68
<i>N</i>	37	27
Death		
<i>M</i>	2.03	2.85
<i>SD</i>	1.19	1.127
<i>N</i>	36	27

As shown in Table 4, male participants displayed a wish for more children when mortality was salient compared to the dental visit control condition, $F(1,125) = 11.39, p = .001$. In contrast, no effect was found for female participants as a function of mortality salience, $p = .12$. Thus, Study 3.3 corroborated the findings of Studies 3.1 and 3.2 showing that mortality salience increased a desire for offspring among male participants and not among female participants.

Relationship. The above analyses were repeated with participant involvement in a stable romantic relationship as a factor. No significant results were found for relationship

status, $ps > .2$, and including relationship status as a factor in the analysis did not affect the significant pattern of results.

Desire for sexuality. We also tested whether the mortality salience by gender interaction could be attributed to an increase in sexual desire. First, regression analysis in which sexual desire was treated as an outcome variable revealed a main effect of mortality salience on the desire for sex, $b = .220$ $SE = .298$, $t = 2.53$, $p = .018$, showing that mortality salience led to a reduction in sexual desire. Next, a three step mediational analysis (Baron & Kenny, 1986) was conducted, aimed at testing whether a desire for sexuality mediated the mortality salience by gender interaction on a desire for offspring. We first regressed desire for offspring onto sexual desire scores, and this analysis did reveal a relationship between sexual desire and the desire for offspring, $b = -.361$ $SE = .052$, $t = -4.32$, $p < .001$ (in the direction of more sexual desire being associated with a lesser appetite for having children). Second, we tested for the original gender by mortality salience interaction on a desire for offspring using regression, first entering each main effect followed by the product term. The original interaction (not surprisingly) was significant, $b = -.293$ $SE = .091$, $t = 3.43$, $p < .001$. Finally, when we added participants' desire for sexuality scores to the regression analysis with the mortality salience by gender interaction, the gender by mortality salience interaction remained significant, $b = .245$ $SE = 0.87$ $t = 3.00$, $p < .005$. This pattern is not consistent with mediation (Baron & Kenny, 1986; MacKinnon et al., 2002). Thus, these analyses suggest that the found gender by mortality salience interaction on a desire for offspring was not mediated by participants' desire for sexuality.

Career strivings. Lastly, to determine whether career strivings interacted with reminders of mortality to influence male and female participants' desire for offspring, we conducted multiple regression analysis with mortality salience, gender, and career striving in the analysis. Mortality salience, gender, and career striving scores were entered in the first step of the regression analysis, followed by the product terms for the 2-way interactions, and the three-way interaction term in the last step. The results revealed a main effect of career-strivings, $b = -.250$ $SE = .015$, $t = -3.12$, $p < .005$, with participants with high career strivings desiring less children than those who had relatively lower career strivings, as well as the original mortality salience by gender interaction, $b = .338$ $SE = .086$, $t = 4.21$, $p < .0005$. These effects, however, were qualified by the predicted three-way interaction, $b = .162$ $SE = .015$, $t = 2.03$, $p < .05$. To explore the nature of this interaction, we assessed a desire for offspring among male and female participants separately as a function of mortality salience and career strivings at one standard deviation above and below the mean ($M = 20.03$, $SD = 5.83$; Cohen & Cohen, 1983).

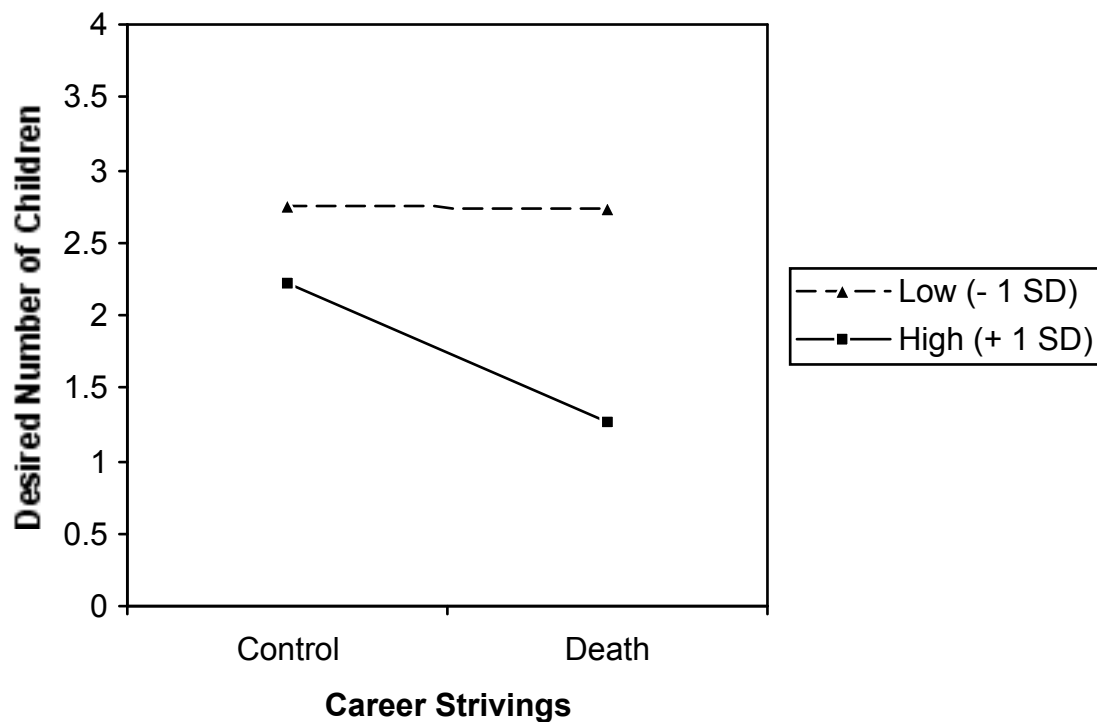
For males, results of multiple regression analysis only showed a main effect in which mortality salience increased males desire for offspring, $b = -.441$ $SE = .141$, $t = -3.46$, $p = .001$. Note, the null effect of career strivings as a moderator of the desire for offspring ($p = .4$) was not caused by a lack of variability on the career striving index among male participants. Indeed, a Levene's test for equality of variances revealed that the two genders did not have a significantly different variance on the career striving index, $F(1,125) = .134$, $p > .7$.

For females, the multiple regression analyses revealed a main effect of mortality salience, with female participants desiring relatively less children after mortality salience compared to the control condition, $b = .226$ $SE = .104$, $t = 2.24$, $p = .03$, and a main effect for

career strivings, $b = -.463$ $SE = .019$, $t = -4.57$, $p < .0005$, in which female participants with high career strivings desired less children than those who had relatively lower career strivings. These main effects, however, were qualified by the predicted mortality salience by career strivings interaction for women, $b = .208$ $SE = .019$, $t = 2.06$, $p = .044$.

Figure 1

Procreation strivings for female participants as indicated by the number of desired children, as a function of a mortality salience by career striving (+/- 1 SD's) interaction (Study 3.3).



As can be seen in Figure 1, the interaction shows that the desire for less children in response to mortality salience compared to the control condition was specific to women who were high

in career striving, $b = .477$ $SE = .144$, $t = 3.21$, $p = .002$. There was no effect for female participants with low career strivings ($p = .97$).

Discussion

The results of Study 3.3 not only replicate the findings of Studies 3.1 and 3.2 showing that men but not women increase their desired number of offspring as a function of mortality salience, but the findings of this study provide evidence in support of our position for why this would be the case. Specifically, we have argued that for women having offspring comes with a potential cost to their career, whereas for men this is not the case. In support of this argument, we found that career striving moderated the effects of mortality salience for women, but not for men. In fact, when women were highly invested in their careers, mortality salience actually led to a significantly reduced desire for offspring. In addition, we replicated the finding of Study 3.1 revealing that such effects were independent of participants' current relationship status.

Moreover, Study 3.3 revealed that participants (both male and female) with a relatively strong desire for offspring expressed less interest in having sex. And in line with previous terror management findings (Goldenberg et al., 2002; Goldenberg, Pyszczynski, McCoy, Greenberg, Solomon, 1999), participants had relatively less desire to have sex after a brief contemplation of their own mortality. These findings, in conjunction with the finding that the mortality salience effect on sexual desire was not moderated by gender, render the alternative explanation that the effects of mortality salience on the desire for offspring (found only among men) could be accounted for by sexual desire extremely unlikely.

One would expect that when women are not invested in their careers at all, that mortality salience should increase the desire for offspring, as it has been found for men. We did not find this to be the case at one standard deviation below the mean for career striving. However, it is important to note that in our sample of participants (i.e., students) even those scoring relatively low in career strivings are likely still committed to their careers. Moreover, as Figure 1 shows, women scoring low on career striving expressed an interest in having almost three children whether or not mortality was salient. This figure is comparable to the ceiling across all our studies. A desire for having three children might be the limit for most participants (indeed, only approximately 6 % of the female participants indicated to desire for more than 3 children). Thus, the absence of an increased desire for offspring at one standard deviation below the mean after mortality salience as compared to the control condition might be accounted for by a ceiling effect on number of desired children. On a theoretical level, however, our pattern of results, in which career striving is conceptualized as a continuous variable that is linearly related to mortality concerns to affect desire for offspring among women, suggests that as women get lower on the continuum of career striving that the response to mortality concerns would be to desire more offspring. This would suggest that for women the desire for offspring may still be a viable defense against mortality concerns under conditions in which it does not conflict with other meaning providing cultural worldviews. In Study 3.4 we attempted to provide more direct evidence for this position by manipulating beliefs about the compatibility of a successful career and having children for women.

Study 3.4

Study 3.4 was designed to more directly test our hypothesis that concerns about the costs of motherhood on career success can inhibit women's desire for offspring in response to mortality salience. Specifically, we aimed to manipulate female participants' views with respect to the advisability of having children in conjunction with a successful career. Subsequent to a mortality salience prime and prior to the desire for offspring measure, participants read one of two bogus newspaper articles about a purported scientific study finding that having children is either incompatible or compatible with career success for women. Since the belief that children can hinder a women's career success has been found to be the dominant view in western societies (Proctor & Roberts, 1987) and was also found to be the majority opinion among women (and more so than among men) in a student sample recruited from the same population as these studies,¹ it was expected that the newspaper article in which careers and children are described as incompatible would only reconfirm the prevailing worldview and lead to the same pattern of results as found in Study 3.1-3.3 among female participants. That is, we expected no increase in women's desired number of children after mortality salience compared to a neutral condition. However, if the failure to find increases in women's desired number of offspring in response to mortality salience in the previous studies could be attributed to concerns about the negative impact of children on women's careers, in undoing this belief, we hypothesized that women would respond to mortality salience with an increased desire for offspring. If we were to find that providing evidence contradicting the incompatibility of children and careers for women actually leads women to respond to mortality salience as did the men in the previous studies, this would

provide important evidence in favor of our hypothesis that concerns about one's career can suppress an increased desire for offspring in response to mortality salience for women.

In addition, the current study was designed to test the hypothesis that career strivings play a central role in most female student participants' worldviews and that in the face of mortality concerns these strivings can override the desire for offspring. Therefore participants' were also provided with a measure assessing the relative value placed on career over family. It was expected that individuals reminded of their own mortality would be relatively more likely to opt for a career over a family.

Method

Participants and Design Eighty undergraduate women from the Free University Amsterdam (average age 21) were randomly assigned to 2 (mortality salience: death vs. control) x 2 (career and children: compatible vs. incompatible) conditions. Participants received E. 2.5 (about 2.5 US dollars) for their participation.

Procedure and Materials Upon arrival in the laboratory, participants were greeted by an experimenter (who was blind to the experimental conditions) and led to separate cubicles, each containing an Apple Macintosh computer. Again, materials and instructions were administered via the computer screen.

Mortality salience and self-reported affect. The first part of the study was similar to the previous studies and contained some filler personality questionnaires, followed by the mortality salience manipulation (with the neutral television control condition), and the PANAS.

Motherhood and children (in) compatibility prime. Participants then moved on to the second part of the study. Participants were told that they were to read a newspaper article followed by some questions about their reaction to the article. Participant in the career-children compatibility condition received a purported newspaper article that stated: “Almost eighty-four percent of women that have children are more satisfied with their jobs and earn more than comparable childless colleagues of the same age ... ‘We think it a matter of priority’, suggests Prof. Dr. Bernard Schafely, one of the researchers of the University of Utrecht ... ‘the switch from raising a child to good functioning on the job floor, appears to be a smaller leap than one would expect.’ Anyway, it is very good news for women who have children ... There may be also disadvantages associated having children, but overall having children is definitely compatible with achieving a career.” Participants were told that, “This is one of the outcomes of a long-term survey among 8,000 career women. In this research the careers of women with no children were compared to the careers of women with children.” Participants in the career-children incompatibility condition read the same article with the underscored words rephrased oppositely.

Desire for offspring. As in Study 3.1-3.3, desire for offspring was assessed with the same two questions about how many children participants desired. Again the two items were highly reliable (Cronbach’s alpha = .90).

Career strivings. Participants were then provided with four items designed to assess relative value placed on one’s career over having a family. In order to camouflage our specific interest in career versus children, participants were also asked to choose between a career or friends//fame/love. For example, the item of interest read: “I would choose a family life over having a career.” Participants could either “agree” or “disagree” with the proposition. For our

purposes then, the score on this measure was a dichotomous “agree/disagree” response to placing one’s career over one’s desire for having children.

Finally, participants filled out a form containing demographic items including relationship status. As a manipulation check, participants were asked about the purpose of the experiment and about the outcomes and content of the investigation described in the “newspaper article.” Participants were then debriefed and dismissed.

Results

Manipulation checks. The first manipulation check assessed participants’ suspicion as to the purpose of the experiment. None of the participants guessed the purpose of the experiment. Secondly, participants were asked to describe the content of the newspaper article in order to confirm that they read and attended to the information presented. All participants in the career-children incompatibility article reported that the article stated that children negatively impacted women’s careers whereas all the participants in career-children compatibility condition answered that children are not harmful to women’s careers.

Self-reported affect. A 2 (mortality salience: death vs. control) x 2 (career and children: compatible vs. incompatible) ANOVA was conducted on the two subscales of the PANAS. As in Studies 3.1 and 3.3, these analyses did not reveal significant effects on the subscales of the PANAS (all $ps > .4$). Therefore the data below were not analyzed with mood as a covariate.

Number of desired children. Desire for offspring composite was subjected to a 2 (mortality salience: death vs. control) x 2 (career and children: compatible vs. incompatible)

between-subjects ANOVA. The results yielded a mortality salience by essay interaction, $F(1, 75) = 4.81, p < .04$.

Table 5

Procreation strivings for female participants as indicated by the number of desired children, as a function of a mortality salience by worldview manipulation (Study 3.4).

Mortality salience	Career and Children	
	Incompatible	Compatible
Control		
<i>M</i>	2.75	2.05
<i>SD</i>	.73	1.29
<i>N</i>	20	20
Death		
<i>M</i>	2.38	2.75
<i>SD</i>	.76	1.43
<i>N</i>	20	20

Specifically, as shown in Table 5, in the children-career incompatibility condition, women's desire for children was not significantly affected by mortality salience ($p > .2$). Note that the pattern of means in the negative children-career condition is comparable with the base rate that was found for female participants in Study 3.1-3.3. However, in this study, when participants had been primed with a positive association between children and a career, they now expressed an increase desire for children after mortality salience, $F(1, 78) = 4.10, p = .046$. Thus, the information arguing in support of the compatibility of having children and a

career for women led to a reaction to mortality salience that was compatible to men's responses in the previous studies.

We did also find an unexpected effect of essay within the television control condition, in which people exposed to the career and children compatible essay expressed less of a desire for offspring than women in the incompatibility essay condition, $F(1, 78) = 4.10, p = .046$.

Career strivings. In order to examine the effects of mortality salience on the relative value placed on women's careers versus offspring we conducted a 2 (mortality salience: death vs. control) x 2 (career and children: compatible vs. incompatible) x 2 (life choice: career vs. children) logistic regression analysis. This analysis revealed a significant life choice by mortality salience interaction, $\chi^2(1, N = 76) = 4.41, p < .04$. In the neutral condition only 15 % of the participants indicated choosing a career over a having children in their life course, whereas in the mortality salience condition 35 % choose for a career over a having children. Thus, mortality salience seemed to promote an increase in how much women valued their careers over having children. There was no effect of the essay manipulation ($p > .1$), nor any interaction between the essay manipulation and the other variables in the analyses ($ps > .81$). Finally, we repeated the logistic regression analyses above with the remaining items (friends/fame/love) and found no effects ($ps > .2$).

Relationship. All analyses were repeated with relationship as a factor. There were no effects on the relationship factor ($ps > .2$) and including relationship as a factor did not alter the significant pattern of any results.

Discussion

In Study 3.4 support was provided for the hypothesis that women's procreation strivings are inhibited under mortality salience by negative worldviews about combining a career and having children. Specifically, we found that female participants who were led to believe that having children was compatible with having a successful career displayed a relatively stronger desire for offspring under mortality salience compared to the control condition. These findings support the hypothesis that female participants, just like male participants, may exhibit an increased desire for offspring after mortality salience when such desire is not inhibited by a conflicting desire to have a successful career. Consistent with the findings in Study 3.1-3.3, female participants who were led to believe that research revealed that having offspring exerts a negative influence on career success did not desire more children after mortality salience compared to the neutral condition, but again showed a trend toward desiring less offspring.

The data did reveal one unexpected finding in which the career-children incompatibility essay actually increased the desire for offspring in the absence of mortality salience. Frankly, we are not sure as to why this is the case. One possibility is that the career-children incompatibility essay may have provoked psychological reactance (i.e., when one feels that one's freedom to choose has been reduced, they often view the "forced" alternative as less desirable, Brehm & Brehm, 1981). That is, participants may have reacted against the pedagogic scientific evidence trying to persuade them against the advisability of having a career in conjunction with having children. However, when mortality salience was primed, and having a career may have become increasingly important to women, the argument may have been viewed as more consistent with their own personal beliefs, and thus less likely to inspire reactance. Of course such post-hoc theorizing is speculative, and more research would

be necessary to test such ideas and determine whether such a finding is even a replicable effect. However, for the purpose of the present research we were interested in the differential effects of mortality salience as a function of the essay prime condition, and specifically, whether mortality salience could increase desired offspring for women when concerns about the threat of children to their career had been eradicated. The results provide support for this hypothesis.

This experiment also revealed that mortality salience promoted career strivings over having a family. Of course the findings for career striving in response to mortality salience was assessed in the context of an experiment in which participants had been exposed to one of the two essays about the compatibility or incompatibility of having a career and children. However, even controlling for exposure to this prime, mortality salience led to a heightened emphasis on career strivings over having children, thus providing additional support for our hypothesis that concerns about one's career are worldview-relevant for women and can suppress an increased desire for offspring after mortality salience. Although one might have expected the essay manipulation to interact with mortality salience, the difference between this dependent measure and the desire for offspring is that expressing increased desire for offspring as a function of the essay prime was not at the cost of one's career (that is, the essay made evident the *compatibility* of the two), where as the dichotomous measure intentionally did not allow for the having both – career and children.

General Discussion

The present research examined the role of mortality salience and gender on the desire for offspring. Based on terror management theory, we hypothesized that reminders of mortality should promote a desire for offspring. However, we also hypothesized that this effect should occur to the extent that it does not conflict with other self-relevant worldviews that also serve to manage existential concerns. Therefore, we specifically expected that mortality salience would increase the desire for offspring for men only, since for women children can represent a threat to another culturally valued domain that can shield against existential concerns (i.e., career success).

In support of these hypotheses, three experiments (Study 3.1-3.3) unveiled a gender by mortality salience interaction on a desire for offspring with mortality salience leading male participants, but not female participants, to express increased procreation striving as indicated by the number of desired children. Thus, on the surface it appears as if the desire for offspring is not part of women's defense system against mortality concerns. However, support was found for the hypothesis that women's desire for offspring may have been inhibited by a conflicting desire to have a successful career (which can also be sought as a defense against mortality salience, as demonstrated in Study 3.4). First, two pilot studies (see Footnote 1) revealed that the governing view among our population (and especially among female students) is that children are a potential impedance to a women's career prosperity. Then, we demonstrated direct support for our hypothesis by the finding that, exclusively among females, career strivings moderated the effects of mortality salience on a desire for offspring (Study 3.3). Female participants who were highly invested in their careers showed a significantly decreased desire for offspring after mortality salience. Finally, in a forth

experiment, we directly tested the hypothesis that women's desire for offspring is inhibited by negative worldviews with regard to the impact of children on one's career. Study 3.4 revealed that when women were exposed to an essay emphasizing the compatibility of offspring and career success, they displayed an increased desire for offspring as a function of mortality salience. These findings support the hypothesis that female participants, just like male participants, may desire offspring in response to mortality concerns when such desire is not inhibited by a conflicting desire to have a successful career. Thus, overall the findings support the proposition that a desire for offspring can function as a terror management defense mechanism.

The Why, When, and for Whom of the Desire for Offspring

Although we have suggested that the desire for offspring can serve a terror management defense, we have been fairly broad in our conceptualization for why. This is not because we are unclear as to which mechanism is being served – meaning, self-esteem, immortality striving – but rather because we assume that each of these mechanisms work in tandem when it comes to the desire for offspring. According to terror management theory, people can obtain a sense of immortality by feeling that they are living up to the standards (i.e., obtaining self-esteem) of one's meaning providing worldview. The desire for offspring is assumed to operate on all these levels, offering a comprehensive symbolic defense mechanism. In much the same way that preparing a child for his first bar mitzvah can give parents a feeling of pride (self-esteem), since it is experienced as a meaningful act that provides a sense of immortality by continuing a tradition that has existed for ages, desiring

offspring can represent a multiple powerful pathway to people's symbolic anxiety buffer, and as such, serve as a vital terror management mechanism within the context of an individual's worldview.

Moreover, based on terror management theory, we made specific causal predictions as for whom and under what conditions people make use of the desire for offspring as a defense against existential concerns. In accordance with Tesser's work on the plasticity of self-defense (Tesser, Crepaz, Collins, Cornell, & Beach, 2000), recent research suggests that the defense implemented to protect one's self against existential terror depends to a great extent on what aspect of the self or one's worldview is currently most salient, accessible, or psychologically pressing (see e.g. Dechesne et al., 2003; Hart, Shaver, & Goldenberg, 2004; McGregor et al, 1998; Wisman et al., 2003). With respect to the current studies, male participants defended against existential concerns with a desire for offspring, presumably because children provide a pathway to a meaningful, valuable, and immortal existence. On the other hand, for the women in our studies (i.e., students), the desire for offspring is unlikely to function as an unambiguous anxiety buffer since children represent a threat to alternative means of managing existential terror. It is not surprising, therefore, that women did not routinely defend in this manner. Indeed, Study 3.2 revealed that female participants displayed worldview defense after mortality salience without showing an increased desire for offspring. In Study 3.4, providing more direct evidence for the plasticity of defense, female participants defended with a desire for offspring if they were led to believe that a desire for offspring was compatible with career strivings. So the desire for offspring was enhanced as a function of mortality salience only to the extent that it did not interfere with other meaningful aspects of

one's worldview. Thus these findings offer support for the hypothesis that people can make use of the shielding capacities of defense against existential anxiety in a most flexible manner.

Interestingly, male participants showed no worldview defense after expressing an increased desire for offspring as a function of mortality salience (Study 3.2). This finding suggests that a desire for offspring was substituted in the place of a more traditional worldview defense. A desire for offspring might be distinctively suitable to substitute for other defensive strategies since it offers a comprehensive pathway to self-esteem, meaning, and a sense of immortality. In addition, in contrast to other defenses which can often be destructive, such as aggression towards people who do not share one's worldviews (McGregor et al., 1998), a desire for offspring represents a more positive, pro-creative if you will, means of protecting oneself against existential terror.

Alternative Perspectives and Future Research

There are however some alternative perspectives that may also account for procreation strivings. It seems plausible, for instance, that a desire for offspring originates in procreation strivings that we share with all living species. However, as has been briefly argued in the introduction, although intuitively appealing, the idea that a desire for offspring is an evolved instinctive drive (Kephart, 1966; Deutsch, 1945) has not been supported (Veenhoven, 1975). There is no evidence that people are equipped with a unique module for a desire for offspring and several arguments have been brought forward against this idea (Veenhoven, 1975). For instance, Veenhoven (1975) pointed out that animals are not motivated by long term effects, such as having offspring. Moreover, reproductive behaviour is usually governed by more

simple mechanisms such as a desire for sex (for a more extended overview and further arguments see Veenhoven, 1975).

Although the conscious desire for offspring might not be directly evolved, one can argue that such a conscious desire may be attached to hard wired innate modules. For instance, we can speculate that people's conscious desire for offspring is entangled with an innate sex drive, and as such, people's desire for sex could operate as a catalyst for desiring offspring. Moreover, if we are willing to assume that this potential association between sex and a desire for offspring is even enhanced after reminders of mortality, this may pose an alternative account for the current findings. However, this hypothesis failed to garner empirical support in the current research. Indeed we found the opposite pattern; participants' desire for offspring was negatively correlated with their sexual appetite (Study 3.3). Moreover, in this research, mortality salience decreased participants desire to have sex and previous research has revealed that sexuality can be experienced as relatively more threatening after a confrontation with mortality (Goldenberg, Pyszczynski, Greenberg, Solomon, 2000; Goldenberg et al., 1999). Furthermore, as has been mentioned previously, it is clear that people can desire to have children independent of a desire for sex. Thus, we believe that it is unlikely that the desire for offspring as a defense against existential concerns is attributable to sexual desire. If sexuality plays any significant role in participant's desire for offspring at all, we suspect it is intertwined with more symbolic structures, such as love, and close relationships (Goldenberg et al., 2002; Mikulincer, Florian, & Hirschberger, 2003).

Thus, another alternative explanation might be that people's desire for offspring is a by-product of people's desire to form close relationships. Indeed, it has been found that

mortality salience motivates people to seek and maintain close relationships (Mikulincer et al., 2003). Consequently, one could argue that the increased desire for offspring after mortality salience is confounded by people's relationship strivings. If this relationship exists indeed we might expect that having a stable relationship would interact with participants' desire for offspring. In the current research, however, it was found that there was no relation between participants' relationship status and participants' desire for offspring after mortality salience. Moreover, if a desire for offspring is merely a by-product of close relationship strivings we might expect, in light of the gender by mortality salience interaction in the present research, that women have a relatively weaker desire for close relationships after reminders of mortality. This is unlikely, however, since recent research revealed that romantic accessibility is more likely for women than for men when facing existential concerns (Arndt et al., 2002). Certainly, the current finding that a desire for offspring can function as an individual symbolic solution to deal existential concerns does not rule out the possibility that a desire for offspring can be simultaneously related to both relationship strivings and an individual desire to cope with existential concerns. A study specifically focused on relationships and the desire for offspring could offer additional insights in the quest for understanding people's motivation to desire children. Transposing the intra-individual context to an inter-individual context may offer an important and promising pathway to extend the current issues.

Although the current research shows that reminders of mortality can increase a desire for having children when to do so does not conflict with other defensive needs, we have not yet considered the role of actually having children in coping with existential concerns. As we

already suggested, children may function as an extension of the symbolic self (Sedikides & Skowronski, 2003), and as such, children in actuality (as opposed to the 'idea' of children) might help to ward off existential concerns. People might for instance feel that death is less threatening because they know that they will continue to exist in a literal and symbolic sense. Or in a related vein, parents might even value cultural normative behaviour of their children more if they are reminded of their own mortality, since that kind of behaviour would validate their symbolic defense system (e.g. Pyszczynski, Solomon, & Greenberg, 2003). Moreover, parents might bask in the glory of their successful offspring as a source of self-esteem (e.g. Cialdini et al., 1975) and it might be possible to discriminate between the death denying function of 'successful' children versus 'unsuccessful' children. This kind of research potentially elucidates why parents are so invested in the success of their children. Examining the death-denying functions of having children, in addition to procreation 'strivings,' constitutes an important issue for future research.

Concluding Remarks

While researchers have extensively studied procreation behaviour among animals ranging from the white whale to the amazon-ant (Dekkers, 2002), human procreation in its full complexity has received relatively scant attention. In the present research, we have shown that reminders of mortality can promote people's desire for offspring; but procreation strivings, as understood as functioning as a psychological defense, can also be inhibited by other needs also functioning to buffer mortality concerns. In this way, we have demonstrated that the desire for offspring can be understood as among the myriad of defenses that one may employ in the service of managing existential concerns. However, the desire for offspring is

not merely another defense, but rather the desire for offspring constitutes one of the most important of all human motivations; for our species continuation is dependent on it. We view the finding that the desire for offspring can assuage human concerns about mortality as encouraging, because it suggests that as a reaction to mortality concerns, induced perhaps by a terrorist attack, people may desire to create new life, instead of wars.

Endnotes

1. In an unrelated study (Wisman, 2003) seventy-six female participants (average age, 21) indicated a dichotomous yes-no response to the question: "Do you think that having children will affect your career chances negatively?" The majority (66 %) of these women indicated agreement with the idea that it is not advisable to combine having children and a career. In addition, in another study (Wisman, 2004) male and female participants (35 females and 16 males, average age 19) were asked: "To what extent to you desire to have children;" "To what extent do you think that having children will obstruct your career chances;" "To what extent do you think having children obstructs career chances more for women then for men," on a 9-point scale (1 = not at all; 9 = very much). Regression analysis revealed that the more participants thought having a career would obstruct their career success, the less they desired offspring, $b = -.557$ $SE = .070$, $t = -4.69$, $p < .0005$. Moreover, female participants ($M = 5.51$; $SD = 1.06$) were more convinced that having children would obstruct their career than male participants ($M = 4.94$; $SD = .85$), $F(1, 49) = 4.29$, $p < .005$, and female participants thought that having children is more negative for women then for men ($M = 6.11$; $SD = 1.34$, compared to ($M = 5.19$; $SD = 1.60$ among male participants), $F(1, 49) = 4.29$, $p < .005$. In sum, both data support our hypothesis that the dominant view among our population (and especially among women) is that children are a hindrance to a women's career success.

CHAPTER 4

Pre-Symbolic Defenses in Terror Management:

To Use or Lose the Symbolic Self?[§]

Without the meditative background that is criticism, works become
isolated gestures, historical accidents, soon forgotten.

Milan Kundera

I think therefore I am is the statement of an intellectual who underrates
toothaches

Milan Kundera

Terror Management Theory (TMT) is a well established theory that has provided major and frequent contributions to the field of psychology and beyond. An impressive number of studies have provided support for a variety of TMT hypotheses (Pyszczynski, Solomon & Greenberg, 2003), and TMT is one of the few theories that can provide feasible explanations for a wide range of human phenomena including taboos surrounding the human body (Goldenberg, Pyszczynski, Greenberg & Solomon, 2000), people's desire for offspring (Wisman & Goldenberg, 2005), rejection and avoidance of out-group members (e.g., Greenberg et al., 1990; Ochsman & Mathy, 1996), and polarization of political views in the aftermath of dramatic historical events such as 9/11 (Pyszczynski, Solomon, & Greenberg, 2003). For these reasons, and more, TMT merits serious consideration, open examination, and continuous exploration.

Alongside of TMT's strength and breath, however, are some reasons to believe that the theory may not be complete. The theory focuses primarily on the symbolic mechanisms

[§] This Chapter is based on Wisman, A. (2006). Digging in Terror Management Theory: To 'use' or 'lose' the symbolic self? *Psychological Inquiry*, 17, 319-327.

(cultural standards and self-esteem) that individuals use to cope with existential anxiety. In this paper, I raise the possibility that individuals may also use pre-symbolic mechanisms to cope with this anxiety. Pre-symbolic mechanisms include phenomena such as flow, sex, secure attachment, and getting lost in a crowd. They operate in large part by reducing objective self-awareness. These mechanisms are evolutionarily and developmentally more basic than the symbolic ones and do not require as great an involvement of symbolic capacities.

I begin by discussing the symbolic buffer that is at the core of TMT. Then, I describe some pre-symbolic mechanisms and present some evidence that they may also be useful in buffering existential concerns. After that, I discuss some factors that may determine when individuals use pre-symbolic mechanisms rather than symbolic ones to manage their existential concerns. Finally, I offer up some speculations on the nature of optimal existential regulation.

Proximal and Distal Defenses in TMT

According to TMT, humans are unique in the animal world in knowing that they are going to die. Like other animals, though, human have an undeniable instinct to stay alive. Together, these features present humans with a unique and seemingly unsolvable problem. Humans are biologically motivated to stay alive but they know that they cannot stay alive, at least not permanently. There are only two logical solutions to this problem: (1) eliminate the instinct to stay alive or (2) eliminate death. Although neither solution is possible in the literal

sense, individuals cope with this existential problem by eliminating the problem of death awareness.

It has been suggested (Pyszczynski et al. 1999) that individuals manage the problem of death awareness through two types of defenses. In the proximal defense, individuals attempt to suppress thoughts of their death or else distract themselves from such thoughts. They may also engage in pseudo-logical denials of vulnerability and the relevance of death concerns (e.g., “I am young. Why would I die?”). Proximal defenses work by removing the problem of death from consciousness. These defenses do nothing, however, to solve the problem. The individual will still die and death related thoughts will still be accessible at the unconscious level. So, at best, the proximal defenses provide only partial and temporary relief.

With distal defenses, individuals make use of their symbolic abilities. According to TMT, individuals develop their own individualized version of the standards and values espoused in their culture (i.e., their individualized worldview) and then try to live in accordance with those standards and values. If they are able to do so, then they attain high self-esteem which in turn buffers them for the fear of death. By living in accordance with their individualized cultural worldview, individuals can come to believe that some important aspect of themselves (e.g., soul, children, values) will live on after the death of their biological body. Thus, unlike the proximal defenses, the distal one allows individuals to believe that they can transcend death in some form. This means that the distal defense can eliminate death concerns at both the conscious and the unconscious level.

There is at least one weakness to the distal or symbolic defense. It only works if individuals have absolute faith in their worldview. Worldviews, however, are relatively arbitrary constructions and there are numerous conflicting worldviews in existence. So,

individuals may be exposed frequently to threats to their worldview. If individuals experience any doubt that their worldview is absolutely valid, then they become susceptible to existential anxiety. After all, if individuals are not living up to the appropriate standards, then they are not assured of transcending death in some way.

In sum, TMT suggests that individuals may use distraction and suppression to cope with their existential concerns on a temporary basis. These proximal defenses do not actually eliminate the problem of death. So, individuals may resort to the distal defense. In this way, individuals come to believe that some aspect of the self will continue after the death of the biological body. There is an internal logic to TMT and a number of studies have provided support for its hypotheses. There are reasons to believe, though, that there may be more types of defenses than captured in the proximal/distal distinction.

Pre-Symbolic Defenses

It is interesting to note that animals and young children do not seem to suffer from existential concerns. It is not that they buffer existential anxiety when it arises. It appears instead that, in the absence of a conceptual self, the anxiety does not arise in the first place. This observation raises the possibility that strategies that reduce an individual's awareness of his or her conceptual or symbolic self might help manage the problem of death awareness -- and not just temporarily.

In his recent book *The Cultural Animal*, Baumeister (2005) noted that humans like other animals have skills that allow them to survive in the physical and social world. These skills, for the most part, are rather basic and allow individuals (and other animals) to eat,

reproduce, fight or flee when threatened, and so on. Baumeister also noted, though, that humans are unique in the extent to which they can create, maintain and participate in a created, cultural environment. This environment grows out of socially shared information and provides individuals with goals, ideas, rules, purposes, and meaning structures. In other words, the cultural environment is largely conceptual. Humans are adept at operating in such a conceptual environment because they evolved as cultural animals living in a cultural world.

In line with Baumeister's distinction between the physical/social environment and the cultural environment, I refer to regulative behavior that is not specific to the cultural world as *pre-symbolic*. These behaviors include affiliation, eating, drinking, having sex, and sleeping. Individuals can enact these behaviors with little involvement of the symbolic capacities they need to deal with the cultural world.

I refer to regulative behavior that is specific to the cultural world as *symbolic*. These are behaviors that rely heavily on conceptualization and what might be called counter-factual knowledge (e.g., goals, standards, future consequences). For instance, students may endure days of hard work locked away from the sunshine by imagining themselves at some future time getting a PhD and landing a job full of meaningful, enjoyable work. As we have just seen, TMT emphasizes the role of cultural or symbolic processing in the buffering of existential concerns. It is possible, though, that individuals may also use strategies in the less conceptual, more physical and social environment to buffer their existential concerns.

Losing the Self as a Defense Mechanism

Although some primates show some mirror mediated self-recognition and as such seem to have a sense of *objective* self awareness (Duval & Wicklund, 1973; Lewis 1992), it is extremely unlikely that primates ponder their own mortality. They seem to lack the cognitive capacities required to entertain thoughts about their own death. In fact, even humans are happily unaware of their own mortality until they reach the age of approximately seven years (Florian & Kravetz, 1985). Thus, to be fully aware of the consequences of life and death, a necessary condition seems to be what Sedikides and Skrowonski (1997; 2000; 2003) call a sense of *symbolic* self awareness. These observations raise the possibility that a loss of self-awareness could lessen the psychological consequences of mortality salience. The individual will still die but he or she will not be overly worried about this during his or her life.

Consistent with the hypothesis that reductions in self-awareness can act as a buffer of existential concerns, several studies have demonstrated a relation between mortality salience and unpleasant self-awareness. Various studies have shown that reminders of mortality promote behaviors that are directed at avoiding a self-focus (Arndt, Greenberg, Simon, Pyszczynski, 1998; Taubman Ben-Ari & Findler, 2005). For instance, participants who wrote about their death spent significantly less time in front of a mirror (a classic measurement of self-awareness developed by Duval & Wicklund, 1972; 1973) compared to participants in a control condition.

In a recent study (Hirschberger, & Ein-Dor, 2005), it was found that eating reduced the effects of reminders of mortality. More specifically, the results showed that participants who were asked to taste food did not show the usual increased defensiveness after reminders

of mortality. By contrast, participants who were not offered food showed more severe judgments of transgressions (a measure of symbolic defense) as compared to a control condition. In short, this study suggests that reducing a self-focus by activating pre-symbolic mechanism (eating) may help to reduce thoughts about mortality.

Such an outcome would be compatible with a number of classic studies on objective self-awareness. For example, individuals smoked relatively more while seated in front of a mirror (Wicklund, 1975). Apparently, the smoking, although life threatening, allows individuals to escape the negative affect associated with their objective self-awareness (see for an overview, Baumeister, 1991).

In the context of TMT, the results of the studies just discussed would be attributed to a proximal defense. Eating, smoking, or avoidance of a mirror do not allow individuals to manage the problem of death. So, they are not likely to reduce the unconscious accessibility of death related thoughts (Arndt, Routledge, Cox & Goldenberg, 2005). Contrary to this conclusion, though, several studies have shown that pre-symbolic behaviors that reduce self-awareness also reduce the accessibility of death related thoughts (Hirschberger, & Ein-Dor, 2005; Wisman & Koole, 2003; Wisman & Shrira, 2006). It appears, therefore, that some forms of pre-symbolic defense go beyond simple distraction or suppression. They can contribute to effective coping with existential concerns.

Another TMT line of research that is relevant in this context reveals that reminders of mortality can increase the willingness to engage in risky behaviors such as reckless driving (Taubman Ben Ari, Florian & Mikulincer, 1999), unsafe sex (Goldenberg et al., 2002), and unhealthy food consumption (Ferraro, Shiv, & Bettman, 2005). These kind of risk taking behaviors are also associated with a loss of self-awareness (Baumeister, 1991). Losing self

awareness can help individuals to cope with unpleasant self awareness that the symbolic self can engenders. For instance, thinking about the 9/11 terrorist attacks led women whose body contributed to their self esteem to chose fruit salad over chocolate cake. Among women whose body did not contribute to their self-esteem, mortality salience had the opposite effect (Ferraro, Shiv, & Bettman, 2005). Thus, individuals with high body esteem seemed to have used self esteem enhancement to manage reminders of death whereas individuals with low body self esteem may have used the pleasant consumption of chocolate to reduce self awareness and as such managed reminders of death. Similarly, research revealed that bingeing may function as a mechanism to avoid identity issues (Wheeler, Adams & Keating, 2001). By engaging in pre-symbolic behaviors, such as for instance continuous food taking, reckless driving, or unsafe sex, individuals may 'shut down' the symbolic self and as such 'regulate' unpleasant self awareness.

In the context of TMT, risk taking behaviors have been explained in terms of self-esteem enhancement. Although the behaviors threaten the individual's life, they also allow the individual to live up to the standards of their culture. We have seen however that a number of studies have shown, that individuals engage in these risk taking behaviors even when their own beliefs or health are at stake especially when no other means of self-esteem enhancement are available (Ferraro, Shiv, & Bettman, 2005; Hirschberger, & Ein-Dor, 2005; Taubman Ben Ari, Florian & Mikulincer, 1999). Such findings are consistent with the hypothesis that when mortality is salient but symbolic means to buffer death anxiety are not accessible, individuals might engage in behaviors that lead them to lose symbolic self awareness. When individuals

are not objectively self-aware they are more likely to engage in behaviors that are inconsistent with their own attitudes (Milgram, 1974, Zimbardo, 1973).

It seems reasonable to suggest, therefore, that both pre-symbolic and symbolic terror management mechanism can effectively reduce death-related thoughts, and that both can do so at the conscious as well as the unconscious levels. Although pre-symbolic mechanisms involve losing the self, and symbolic mechanisms involve using the self, both accomplish the same goal. They reduce the accessibility of death related thoughts.

The Social Roots of Pre-Symbolic Defenses

Why should pre-symbolic defenses reduce the accessibility of death related thoughts? An answer can be found in human cultural evolution. In line with TMT (Pyszczynski et al., 2003), it can be argued that humans had to deal with the problem of death before they developed extensive symbolic solutions to address the problem. If this argument is correct, then in earlier stages of our cultural development, humans relied on pre-symbolic structures to manage death awareness. Moreover, these basic mechanisms may still in place. Evolution tends to build on the past rather than cast it off and start anew. It does not throw out an old brain system, for example. Rather, evolution modifies and extends the existing system (Allman, 1999). Similarly, wings seemed to have evolved out of existing limbs rather than out of a total new structure. It seems reasonable to suppose, therefore, that the more recently developed symbolic solutions to the problem of death may have their roots in pre-symbolic structures. If so, then an examination of these roots may give us insight into other mechanisms that might buffer existential concerns.

Our ancestors lived the first 90 percent of their existence in small, close knit groups (Maryanski & Turner, 1992; Sahlins, 1972) that were linked to larger social networks (Van Vugt & Van Lange, 2006). A likely pre-symbolic candidate that may have preceded symbolic defenses, therefore, are affiliative strivings (Baumeister & Leary, 1995). From an evolutionary perspective, belonging to a group confers many important advantages. It improved an individual's ability to gather food, it increases likelihood of mating, and it confers greater protection against threats from the environment (Baumeister & Leary, 1995; Buss, 1991; Sedikides & Skowronski, 1997). Given the adaptive benefits associated with belongingness, it seems likely that vigorous psychological mechanisms would have evolved to ensure that individuals to form strong association between themselves and their social group, and to minimize the danger of becoming isolated or expelled from the group (Abrams, Marques & Hogg, 2005; Baumeister & Leary, 1995; Mikulincer et al., 2000; Taylor et al., 2000).

Indeed, numerous studies have demonstrated the significance of a need to belong in human motivation. For instance, it has been shown that social exclusion impairs self regulation on several tasks (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Moreover, although some aspects of affiliation might have become more abstract and symbolic (belonging to a nation), others seem connected with innate mechanisms (MacDonald & Leary, 2005) and play a major role in coping with distress (Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996; Taylor et al., 2000).

Becoming immersed in a group can also lessen objective self-awareness. This has been demonstrated in a wide range of classic social psychology studies (Diener, 1979;

Milgram, 1974, Mullen, 1991, Zimbardo, 1973). In addition, when individuals become immersed in a group, they cease comparing their behavior against their own standards and they feel less concerned about how others may evaluate their behavior (Mann, et al., 1982).

It is possible, therefore, that mortality salience engenders a pre-symbolic defense related to belongingness and affiliation. From this perspective, it is natural for individuals who are threatened to seek to hide in a crowd. In doing so, they also reduce their objective self-awareness. This, in turn, can reduce their existential concerns, which can only exist in the presence of a symbolic self.

If this reasoning is correct, then mortality salience should increase the desire to lose one's self in a group and this, in turn, should reduce the usual effects of mortality salience (e.g., derogation of an outgroup member). Evidence that this is the case was obtained in Chapter 2 in a series of studies by Wisman and Koole (2003). In these studies, reminders of mortality induced in participants a tendency to sit next to and among fellow group members as opposed to sitting alone. Moreover, this was true even when the increased affiliation meant that participants' worldviews were threatened by the group with whom they were affiliating and when affiliating with the group meant that participants had to attack their own worldviews. It is difficult to interpret such findings in terms of a distal symbolic defense (e.g., bolster worldview). It appears instead that mortality salience motivated participants to affiliate and that in so doing participants lowered their awareness of their symbolic self.

Further evidence that it was a reduction in self-awareness that allowed participants to feel comfortable affiliating with individuals who held worldviews contrary to their own was obtained by Wisman and Shrira (2005). They found that, compared to participants in the control condition, participants reminded of death sought greater physical proximity with a

group of individuals, but had no greater willingness to socialize with a confederate (such as having a cup of coffee). In other words, the effect of mortality salience was specific to losing one's self in the crowd and not merely affiliating with others. It is also interesting to note that participants who sat with a group who held worldviews different from their own expressed a weaker defense of their worldview.

In sum, it appears that a pre-symbolic mechanism, such as affiliation reduced symbolic self-awareness which in turn reduced the effects of mortality salience. This effect does not seem due to distraction or suppression and unlike the worldview defense it does not promise some form of immortality. Rather, individuals who lose themselves in the group seem to lose their objective self-awareness and in the absence of a symbolic self, there can be no existential concerns.

Importantly, these findings and theorizing are corroborated by a developmental perspective (Bowlby, 1969; Florian & Mikulincer, 1998). Human infants are not born with a ready made symbolic solution to the problem of existential fear. Therefore, it is likely that when death awareness first awakes in them, human infants have to rely on mechanisms (e.g., safe attachment) that do not require the cognitive capacities that are associated with symbolic awareness (Bowlby, 1969; Florian & Mikulincer, 1998). These pre-symbolic mechanisms may still function to ward off fears, including existential ones.

Consistent with this hypothesis, Mikulincer and associates (2003) proposed that close relationships may form an anxiety-buffer that is functionally distinct from worldview defense. Indeed, numerous studies show that secure attachment figures can function to ward off existential fear (Mikulincer & Florian, 2000; Mikulincer, Florian & Hirschberger, 2003). In

fact, only insecurely attached individuals were found to respond to mortality salience by increased worldview defense (Mikulincer & Florian, 2001). By contrast, securely attached individuals were found to respond to mortality salience by increasing their desire for intimacy.

Related results were obtained by Taubman Ben-Ari et al. (2002). They found that mortality salience led to more willingness to initiate social interactions, especially among securely attached individuals. Finally, research has demonstrated that thoughts of romantic commitment reduce death thought accessibility (Florian, Mikulincer & Hirschberger, 2002; Hirschberger, Florian & Mikulincer, 2003). In sum, this body of research along with the Wisman and Koole (2003) findings suggest that individuals can make use of affiliation, a pre-symbolic mechanism, to manage the terror that is associated with death awareness.

To Use or Lose the Symbolic Self?

When do individuals use symbolic mechanisms (e.g., culture, self-esteem) to buffer themselves from existential concerns and when to they use pre-symbolic defenses? A consideration of the research derived from objective self-awareness theory (OSA, Duval & Wicklund, 1972; Wicklund & Gollwitzer, 1982; 1985)** may shed some light on the conditions that favor one strategy over the other. According to this theory, when individuals become aware of themselves as an object of evaluation, they become more aware of the discrepancies between their actual self and the standards set for the self. This discrepancy, in

** Note that this comparison is not to suggest that death awareness is equal to 'negative' self awareness but rather that the strategies that individuals may use to tackle the awareness of death may resemblance the strategies to reduce self awareness as proposed by the OSA theory. For a broader discussion about the relationship between self awareness and the awareness of mortality see Silvia, 2001

turn, arouses negative affect which motivates individuals either to avoid self-awareness or reduce the discrepancy.

If the discrepancy is relatively small or if individuals feel that they can reduce the discrepancy, then they attempt to do so. For instance, students may realize that they did not study enough for their last exam. So, they may decide to study harder for the next exam. In doing so, they may be able to reduce the discrepancy between their actual test performance and their desired performance.

If individuals feel that there are unable to reduce the discrepancy, however, then they may attempt to reduce self-awareness more directly (Carver, 1975; Silvia & Duval, 2001; Wicklund & Duval, 1971; Gollwitzer & Wicklund, 1985). For instance, students who do poorly on a test may go out and drink till the fat lady sings the blues. This activity will not improve their performance on the next test, but it may help them avoid the negative feelings aroused by their poor performance (i.e., the discrepancy between their desired and actual performance). Indeed, various studies have illustrated that individuals eat, drink, or use drugs to reduce their sense of self-awareness (for a broad overview see Baumeister, 1991).

This research raises the possibility that individuals with strong, coherent worldviews may attempt to manage mortality salience with worldview defense because doing so provides them with an unequivocal solution to the problem of death (see Dechesne et al., 2003). Individuals with weaker, less coherent worldviews or individuals who believe that they cannot live up to the standards of their worldview are left without a clear way to attain immortality. As a result, they may attempt to cope by using behaviors that reduce their objective self-awareness.

In chapter 3^{††}, it was hypothesized that reminders of mortality increase people's desire for offspring. However, it was argued that a desire for offspring can conflict with other symbolic defenses.

For instance when women (female students) fantasize about having children they might consider the implications for their career and themselves, while it is possibly for men to consider having children without much worries (for a broader discussion see Chapter 3). Consequently, thoughts about having children may initiate discrepancies (for instance, how will I finish my masters when I become pregnant?) among female students while this is relatively less the case among men (Biernat, & Wortman, 1991 Roskin & Carrier, 1994).

Therefore, it was hypothesized that reminders of mortality increase people's desire for offspring to the extent that it does not conflict with symbolic self-relevant worldviews that also serve to manage existential concerns. Indeed, we found support for the hypothesis that female participants with high career strivings (conflicting worldviews) show a less pronounced desire for offspring after mortality salience. Moreover, female participants with high career strivings were found to be more defensive on other measurements in response to mortality salience. However, it was also found that if this conflict was reduced (by an experimental manipulation), female participants, just like male participants, showed an increased desire offspring in response to mortality concerns. Thus, OSA theory informs us as

^{††} In Chapter 3 and Chapter 4, I discuss the desire for offspring as part of people's symbolic defensive system. It is intuitively tempting though to consider a desire for offspring as part of a pre-symbolic evolved mechanism. However, as discussed in Chapter 3, evolutionary psychologists typically do not talk about evolution as fostering *conscious desire* to pass on one's genes. Moreover, since a desire for offspring involves cognitive capacities such as self reflection, (How would it feel to be parent?), planning (When will I have children?) and, anticipation (If I make love now I will be parent in the future), a desire for offspring seems to be a typical product of humans' evolved symbolic self. I believe however that considerably more research is necessary to arrive at mature conclusions about the nature of people's desire for offspring.

to when, why, and whom can make use of a certain worldview in response to reminders of mortality.

More generally, bridging OSA theory and TMT, suggests that individuals make use of symbolic solutions (worldview defense) to reduce death thought accessibility when symbolic solutions are accessible and seem sufficient to solve the problem of death, but they may attempt to lose symbolic self awareness when symbolic solutions are not accessible or do not seem sufficient to solve the problem of death.

Toward an Optimal Existential Regulation

Both the proximal and the distal defenses suggested in TMT seem to have their weaknesses. The proximal defense seems to be temporary and restricted to conscious thoughts. Moreover, most of the behaviors (e.g., drinking, over-eating) individuals use to distract themselves from unpleasant thoughts contribute to non-optimal functioning. By comparison, the distal defense can eliminate the problem of death but it is based on an arbitrary, constructed worldview. These structures need continuous social validation. Because there are countless contradicting worldviews, individuals can never be sure that their belief system is the only correct one. The insecurity surrounding one's worldview could promote defensiveness and outgroup derogation, and even extremism (e.g. Pyszczynski et al., 2005; McGregor, Zanna, Holmes, & Spencer, 2001).

The final problem with the distal, symbolic defenses is that they are abstract. They exist in our heads and lack a direct touch with reality. The great source of inspiration for all TMT researchers, Ernest Becker (1973), acknowledged this problem and noted that

whatever symbolic solution we invent or choose we remain just as mortal as a cockroach or a peacock.

Is it possible for individuals to develop an existential defense mechanism that is more effective than either the proximal or distal defense? In general, such a defense would be grounded in the real world, would not be fragile, would be well connected to the individual's genuine values, but would not promote objective self-awareness. Activities such as dance, martial art, sports or religious activities seem like promising candidates. These activities allow individuals to lose their self focus but and at the same time increase their feelings of self worth by engaging in behavior that is approved by the cultural standards or their own set standards (Leary, 2004). Similarly, affiliative behaviors can be associated with a reduced focus on the self as well as with pro-social behaviors (Joireman, 2005). It appears, therefore, that optimal existential regulation should incorporate some using and some losing of the symbolic self.

Perhaps the prototype of the use/lose balance is the flow experience (Csikszentmihalyi, 2000). During flow, individuals seem to lose themselves and become completely immersed in activities. They experience intense positive affect, a disruption of the sense of time, and few off-task thoughts. Flow also quiets the self. Individuals in flow are not aware of themselves as objects of evaluation.

Flow is more than just the absence of self-awareness, however. In fact, during flow, individuals are keenly aware of their activities. Moreover, individuals do not experience flow during activities that have no meaning or intrinsic value to them, and flow is associated with a growth in the self. In short, individuals engaged in flow are immersed in an activity that is close to their authentic self (Csikszentmihalyi, 2000). So, flow might come close to what we

may call optimal existential regulation. It balances aspects of using and losing the symbolic self. As a result, it is a strong candidate for an effective, long-term buffer of existential concerns.

This hypothesis is congruent with suggestions by Martin (1999). He proposed that flow may be a general moderator of a number of social psychology phenomena, including mortality salience. In fact, he reported that, in comparison to a control conditions, mortality salience increased outgroup derogation only among participants who reported experiencing low levels of flow. Mortality salience had no effect on individuals high in flow.

The Individual in Relation to the Group

I have suggested that getting lost in a crowd may serve as an effective buffer for existential concerns. However, as Heidegger (1982) noted, merely following the crowd keeps individuals from establishing their authentic self and allows them to hide from their existential concerns (Martin et al, 2004). Ernest Becker (1973) formulated the problem this way:

Most people play it safe: they choose the beyond of standard transference objects like their parents; the boss or the leader; they try to be a good provider or a solid citizen. In this way they earn their species immortality as an agent of procreation, or collective or cultural immortality as part of a social group of some kind.

This not necessarily optimal, though. As noted by Martin et al. (2004), by adopting widespread cultural values, individuals may:

lose themselves in their daily business and worldly affairs, and avoid the awesome responsibility of having to define their essence for themselves. They base their life choices not on personal values but on widely shared cultural values that, while seeming to be absolute, may not be valid for them as unique individuals. As a result, these individuals fail to become the unique individual they are capable of becoming.

Although individual often seek the crowd to buffer themselves from the fear of death, it is precisely this fear that may lead them to separate themselves from the group (Heidegger, 1982; Martin et al., 2004). Individuals who have had a near death experience (NDE) often switch their worldviews to a more individuated worldview and reported greater well-being (Tedeschi & Calhoun, 2004). They also experience a sense of liberation, of being able to choose what they really want to do and are less concerned about the opinion of others (Martin et al., 2004).

Related findings have been obtained by Cozzolino (et al., 2005; For a more elaborated discussion Cozzolino this issue). They distinguished between mortality salience and death reflection and found that the former led highly extrinsic participants to manifest greed, whereas the latter led them to manifest intrinsic, unselfish behavior (Cozzolino, Staples, Meyers, Samboceti, 2005). This and other studies showed that reflections upon one's death may provide the soil for a more authentic life style. Such a lifestyle seems to involve a balance of losing the self and using the self as well as a balance of hiding in the crowd and being a unique individual. With this balance, individual lose their objective self-awareness and remain true to their authentic values. As a result, the fear of death, which is based on a highly accessible symbolic self, cannot take hold.

Thus, optimal existential coping may involve a consideration of the self in relation to the group. This may involve some degree of deviation on the individual's part. Thus, optimal functioning may come at a price. As Becker (1973) put it:

It takes strength and courage the average man does not have and could not even understand the most terrifying burden of the creature is to be isolated which is what happens in individuation: one separates himself out of the herd. This move exposes the person to the sense of being completely crushed and annihilated because he sticks out so much, has to carry so much in himself (Becker, 1973).

Concluding Remarks

The psychological confrontation with death is undoubtedly one of the most puzzling and challenging problems that each individual must face. Because individuals evolved with an instinct for survival in juxtaposition with the awareness of the recognition of the impossibility of their mission, they need to rely on psychological defenses to shield themselves from existential anxiety. According to the TMT, the belief in something larger and longer lasting than ourselves and the conviction that what we do is meaningful are all elements of symbolic structures (worldviews) that function as shields against the awareness of our terrifying fate. The current perspective recognizes the importance of symbolic solutions to the problem of death, but suggests that not all human beings are capable or willing to construct and maintain beliefs that provide an illusion of transcendence. For these individuals, pre-symbolic mechanisms may provide only a temporary respite. When used optimally, though, these

mechanisms can lower objective self-awareness and effectively eliminate death-related thoughts.

I believe that the proposed framework contributes to the TMT in several ways. First of all the proposed framework synthesizes a wide range of theoretical perspectives into one comprehensive framework of existential regulation. As discussed, well established theories like, The Need to Belong Theory (Baumeister & Leary, 1995), Attachment Theory (Bowlby, 1969), Self Awareness Theory (Duval & Wicklund, 1972), and the main tenets of evolutionary psychology (Buss, 1991) are highly compatible with the current theoretical framework. Second, the proposed framework extends the core logic of TMT. We have seen that TMT posits that people use the same structure (the symbolic self) that gives rise to the problem (death awareness) in the first place. Following this logic, I posit in the current framework that if the symbolic self commenced the potential for death anxiety indeed, then ‘shutting down’ that same symbolic self should avert the problem of death awareness. Third, the current framework provides a simplified model that can account for several anomalies within the TMT. For instance, from a TMT perspective, pre-symbolic defenses like affiliation strivings are merely another way to validate one’s personal worldview. TMT has difficulties to explain why in certain situations people seek affiliation even with people who oppose one’s own personal beliefs. The current framework gives a full explanation as to how and when people use pre-symbolic defenses, like affiliation strivings, to reduce unpleasant self-awareness that reminders of death provoke. People not only ‘use’ the symbolic self but people are under specified circumstances motivated to ‘lose’ the symbolic self to manage existential concerns. Fourth, the proposed framework provides unique predictions that might be applicable to clinical settings. For instance, individuals who suffer from depression might be

encouraged by clinical psychologists to engage in meaningful activities that not only strengthen the individuals' worldview, but also reduce symbolic self awareness. Hence, I suggest in this dissertation that optimal existential regulation constitutes of a balance between both 'using' and 'losing' the symbolic self. Finally, a better understanding of the working of alternative strategies and perhaps more primitive solutions to the problem of death might elucidate why so many human beings endorse symbolic structures that not only terrorize themselves but also constitute a major threat to peaceful coexistence.

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Summary

Sooner or later people start to realize that they are, like all living organisms, subject to a deathly causality. Birth predestines mortality. Since avoiding mortality is at the core of success in any species it may not come as a surprise that a reminder of the inevitability of one's own demise does not leave people indifferent. The TMT posits that the unique adult human ability of mortality awareness in conjunction with an instinct for survival shapes a potential for death anxiety. Indeed, a large body of research revealed that (Solomon, Greenberg, & Pyszczynski, 1991; Greenberg et al., 1997; Pyszczynski et al., 1999) reminders of death instigate numerous regulative mechanisms. More specifically, research inspired by TMT (Greenberg, Pyszczynski, & Solomon, 1986) shows that people manage the potential terrifying thought of mortality, outside conscious awareness via seemingly unrelated 'distal' symbolic defenses (cultural worldviews) that function as a death 'transcending' buffer (e.g.). In this dissertation I argued that, aside symbolic terror management, several additional terror management mechanisms operate to manage reminders of one's own mortality.

In Chapter 2, I highlighted the role of affiliation strivings in managing reminders of mortality. More specifically in Chapter 2, across three different experiments, it was found that mortality salience led to increased affiliation strivings, as indicated by a greater behavioral tendency to sit next to others (Study 2.1-2.3), and a more pronounced preference for sitting within the group as opposed to sitting alone (Study 2.1-2.3). Thus the tendency to affiliate with other individuals seems a powerful reaction towards death-related thoughts. Importantly, mortality salience even led to increased affiliation with other group members that had previously threatened participants' worldviews (Study 2.1-2.2), and even when affiliation with the group forced participants to attack their own worldviews (Study 2.3). As such, it

appears that affiliation defenses were powerful enough to override symbolic worldview validation.

In Chapter 3, I hypothesized that reminders of mortality (mortality salience) should promote the desire for offspring to the extent that it does not conflict with other self-relevant worldviews that also serve to manage existential concerns. In support of these hypotheses, three experiments (Study 3.1-3.3) unveiled a gender by mortality salience interaction on a desire for offspring with mortality salience leading male participants, but not female participants, to express increased procreation striving as indicated by the number of desired children. Thus, on the surface it appears as if the desire for offspring is not part of women's defense system against mortality concerns. However, support was found for the hypothesis that women's desire for offspring may have been inhibited by a conflicting desire to have a successful career (which can also be sought as a defense against mortality salience, as demonstrated in Study 3.4). First, two pilot studies revealed that the governing view among the population (female students) is that children are a potential threat to a women's career. In Study 3.3 I found indeed support for the hypothesis that, exclusively among females, career strivings moderated the effects of mortality salience on a desire for offspring (Study 3.3). Female participants with relatively high career strivings showed a significantly decreased desire for offspring after mortality salience. Finally, I directly tested the hypothesis that women's desire for offspring is inhibited by negative worldviews with regard to the impact of children on one's career. Study 3.4 revealed that when women were exposed to an essay emphasizing the compatibility of offspring and career success, they displayed an increased desire for offspring as a function of mortality salience. These findings support the hypothesis

that female participants, just like male participants, may desire offspring in response to mortality concerns when such desire is not inhibited by a conflicting desire to have a successful career. Although, this chapter clearly revealed that people's desire for offspring is moderated by cultural worldviews it was argued that a desire for offspring is more than just a worldview because the continuation of our entire species may depend on it. On the whole the findings support the proposition that a desire for offspring can function as a terror management mechanism.

Overall, Chapter 2 and Chapter 3 are in line with the generic hypothesis of the present dissertation that people make use of flexible system consisting of multiple terror management defenses.

In Chapter 4, I presented a novel theoretical framework that raises the possibility that people use pre-symbolic solutions to the problem of death awareness. According to the TMT, people use the symbolic self manage death awareness. Indeed, as have been discussed throughout this dissertation, most TMT findings show that people solve the problem of death by using symbolic structures that provide an illusion of immortality or in a way 'extend the self' (e.g., religion worldviews meaning etc). However if the symbolic self commences the potential for death awareness then we may predict that 'shutting down' that same symbolic self should also avert the problem of death awareness. A way to shut down the symbolic self might be the activation of pre symbolic mechanism. Pre-symbolic mechanism include phenomena such as sex, affiliation, attachment, eating, and sleeping. In Chapter 4, I present evidence that these mechanisms are evolutionarily and developmentally more basic than symbolic mechanism and do not require as great an involvement of symbolic capacities. Empirical evidence was presented to demonstrate that pre-symbolic mechanism might work

to ward off existential concerns by reducing self awareness. Moreover, it was argued and evidence was presented to demonstrate that the activation of pre-symbolic mechanism might reduce existential concerns. Thus, I argue that both pre-symbolic and symbolic terror management mechanism can effectively reduce death-related thoughts, and that both can do so at the conscious as well as the unconscious levels. Although pre-symbolic mechanisms involve losing the self, and symbolic mechanisms involve using the self, both achieve the same goal. They reduce the accessibility of death related thoughts. Finally, in Chapter 4, I discuss that optimal existential regulation would constitute of a dynamic balance between losing and using the symbolic self.

Overall the results of this dissertation were in line with the generic hypothesis of this dissertation that people make use of multiple terror management mechanisms to ward of existential fear. More specifically the results show that aside symbolic means, individuals can use pre-symbolic means, such as affiliation strivings and procreation strivings to ward off existential concerns

To end the end of this dissertation and leave the reader behind with more then a dead end we may conclude that although the ends of life are marked by birth and death, the recognition of death can bring people together and shape the cradle of new life.

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